DOMESTIC ENGINEERING

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Times of Unrest Augur Greater Progress

People who have a narrow view of things get considerably disturbed over the newspaper reports and magazine articles on trust-forming and trust-busting, and all the subsidiary supposed-to-be alarming features attending them.

There really is no cause for alarm, any more than there is a cause for alarm in the mind of a hunter because he notices that his gun has a recoil on his shoulder when a shot is fired. There used to be a time when we first started to use a pistol, when a man's proficiency in firing it was in proportion to his allowance for the kick. If he wasn't a good guesser as to the extent of the kick, he didn't hit the object he aimed at. Scientific study of firearm construction has developed a mechanism which takes care of the kick inside the firearm so that the hunter is unaware of it, but the kick is still there and it has to be paid for in wear and tear on the apparatus.

It must always be borne in mind, in reasoning about anything, that when you integrate a thing you have taken the first steps toward its disintegration, and when it is disintegrated you have provided for its reintegration. The statement is so important that it will pay anybody to sit down and think about it for 60 minutes. **There are very few people who can think about anything for 60 minutes.**

We are confronted daily in our newspapers and magazines by trust-dragons, some of them real, many of them imaginary, and **for the creation of all of them we ourselves are, in the ultimate, responsible.** We are responsible for them not in a guilty sense, but because it is a part of the universal order of things. The perpetuation of the universe is dependent upon a continual centralization and decentralization of its parts and forces.

A trust is no more than a magnificent presentment of the same "get-together" policy that was adopted by the early settlers in our country, when they banded together in communities, hamlets, villages and stockades for protection against outward attacks by animals and savage foes, and for more commodious interchange of the necessities of life. The formation of a trust as a trust is no more a menace to our national industry than is the formation of a partnership or a stock company. They are all centralizations of industrial forces in varying degree, proportionate to the abilities of those composing the respective combinations, and to the possibilities existing in the territory in which they are formed.

A wicked partnership is as evil a thing as a wicked trust, and a wicked individual can do as much proportional damage as any of them. We have paraded before us the evils of the oil-trust, the tobacco-trust, the coal-trust, the cotton-trust and even the bathtub-trust. There is only one trust that has not yet been attacked with any degree of intelligence. In fact, it has scarcely yet been named. It is the biggest trust of all. It is the labor trust.

The basic principles underlying the formation of all these trusts are good and right. They embody the constructive spirit of action, and supplant the disintegrative spirit of competition. The weakness of the trust-proposition is that the founders seem to be ignorant of the fact that disintegration must be provided for in any scheme, for the attainment of any degree of perpetuity.

All these government-investigations are creating in the minds of many business-men, whose optimism or pessimism is based on details rather than on essentials, a spirit of unrest and dissatisfaction. They fear that the country is going to the dogs because their own petty business-interests have perhaps dropped in valuation 5 per cent. The only way to have confidence in things is to sit back and watch the procession. In watching it, **the stragglers in the commercial game will be found to be in disproportion to those who are keeping step** and forming line for the accomplishment of the best things in the march of progress.

We are at the half-way house. There is now taking place a great change in our political and commercial arrangements. We have been so busy

integrating things that we have forgotten to provide for disintegration. Yet if we had been students, we would have known that disintegration would come. **It is not sportsmanlike to whine because we find that we have to pay our gambling debts.**

Take, for instance, the rapid extension of the farming interests. First we have given land away, in order to sell railroad stock, and we have watered the railroad stock good and plenty. Then, when we couldn't sell any more railroad stock, we sold land instead of giving it away, with the idea of making the farmer raise the price on contiguous real estate so that we could make more money by selling residence-sites. Then, to keep alive the business-proposition, we have given away factory-sites, to get factories from which to fill the residences we put on the lots already sold at a profit. Then we had to start to work to make good. We had overcapitalized everything, and we have had to pay the bill. To pay our bills, we raised our prices to the consumer, and we juggled with food and other stocks to make them go down in value so that we could buy them again at somewhere near the right figure. **Of course, somebody lost, and we have been mad enough to think that we gained at the expense of somebody else, without realizing that in the end we would still have to pay somebody's bills, because we had taken away from somebody all he had to pay them with.** Unrest? Sure, there is unrest. We are largely responsible for it.

It is because of this unrest that the farmer is paid 35 cents for potatoes for which the city man pays $1.50, a small advance of 300 per cent, of which only 30 per cent went for freight and handling. It is because of our ignorance of these vital matters that a steer which is worth $50 costs the city man now, at the prices paid on an average at the leading restaurants of Chicago, $2,000. It is for the same reason that the cost of all meats is raised from 800 per cent to 2,000 per cent to the consumer, and turkeys bought at 12 cents per lb. from the farmer are sold at 36 cents to the consumer.

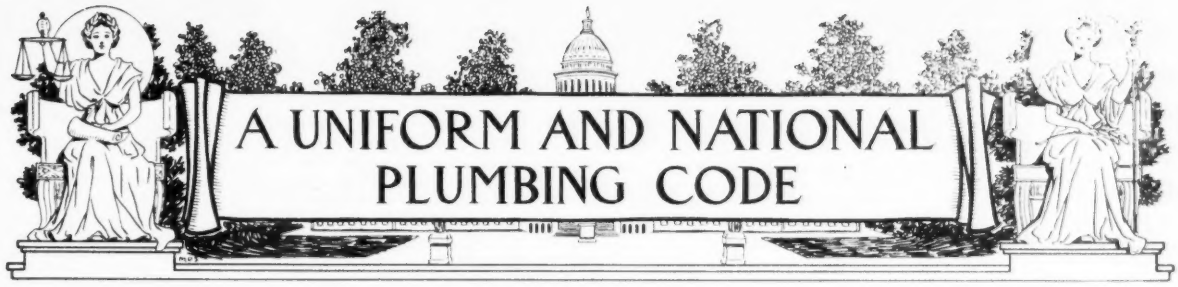
No wonder we need readjustment, but the readjustment is going to be beneficial, and if, instead of sitting idly by and bewailing our sad lot, and letting politicians pull the strings, **we pay some definite attention to our national business administration,** we will have no cause for dissatisfaction.

As to the labor-proposition, it offers the most serious menace of any. It is a trust that has now gotten the advantage of any other trust. To illustrate the difference, it affords the same contrast that is presented between the gentlemanly burglar who tips his hat politely, takes your watch and other valuables from you and bids you a pleasant good-evening, leaving behind him no other shock than the loss of the property, and the hold-up man who sandbags you from behind and leaves your wife and family without support, even though he should find that your clothes contain only a dime. **It is a trust without a sense of responsibility.** Its members are ruled by force. It is more despotic in its rulings than any czar of Russia. It is so powerful that its hired assassins can load our courts and openly make mock of our ineffective legislation. Labor unions are composed of hundreds of thousands of respectable men, hard-working men, men who have as high a respect for law and justice as any of the citizens by whom they are employed. These members are also under the thrall of the labor trust, with less freedom of speech than we have.

Finally, what we said in the first paragraph of this editorial remains true. **There can be no integration without disintegration.** We note in the newspapers at the present time many signs of the breaking-up of this labor-trust power. The Western Federation of Miners, of the United Mine Workers, is already taking steps to withdraw from the American Federation of Labor, and there are many similar signs of dissatisfaction with the heads of the arbitrary labor-trust, whose members are to be found in control of the different labor-organizations.

The unobservant individual thinks that because a body is big, its existence forever is insured by virtue of its power. **The bigger the body, the more risk of gangrene, and the quicker its spread.** We are come into new times, and if we are clear in our thinking and pay attention to the quality and quantity of our thinking, then we need have no fear for the future of our commercial enterprise. In the words of James Russell Lowell:

New times demand new methods and new men;
The world advances, and in time outgrows
The laws that in our fathers' day were best;
Doubtless after us some purer scheme
Will be shaped out by wiser men than we,
Made wiser by the steady growth of truth.
The time is ripe, and rotten ripe, for change;
Then let it come. I have no dread of what
Is called for by the instinct of mankind.
Nor think I that God's world would fall apart
Because we tear a parchment more or less;
Truth is eternal, but her effluence,
With endless change, is fitted to the hour.
Her mirror is turned forward, to reflect
The promise of the future, not the past.



By Henry D. McCormack, C. E.

XX.

GREASE TRAPS.

Grease traps have occupied but little space in plumbing codes, heretofore, but from now on there will be an awakening to the importance and necessity of this useful contrivance. During the past 30 or more years, most of the sewers built throughout the United States were planned on the combined system. That is, they were intended to carry off both the rain-water and the household sewage. These sewers were so copiously flushed with storm-water at certain intervals, and were comparatively so large that in large cities, particularly, greasy water could be discharged into them with impunity. I say in large cities in particular, because in the large cities the streets are so closely built up, and so many people are crowded into a block, that more water is always flowing through the sewer mains than in small cities where sometimes only one or two houses will occupy a plot a block square, and for hours at a time, perhaps, no water will flow through the sewers whatever.

A change is about to take place in the future design of sewers, however, that will have a far-reaching effect on the design of plumbing systems within buildings, and the framing of plumbing codes. This change will be brought about by the awakening of the public to the filthy practice of polluting streams and lakes with raw sewage. Already a movement has set in to conserve the inland waters in their natural purity, and a demand insistent and urgent to the city and state officials to purify all sewage.

It is the purification of sewage, then, that will modify the work within the buildings. To purify a volume of sewage equal to the combined storm-water and domestic sewage would necessitate the construction of plants far in excess of the average capacity, and this large plant, or a great part of it, would be idle, sometimes for months at a time, during dry seasons or spells; then when a rain storm of unusual severity came along, the plant would be taxed beyond its normal capacity, an unsatisfactory effluent would result, and the scouring action of the water throughout the tanks would upset the established order of the reducing micro-organisms within.

In cities already sewered according to the combined plan, where the point is reached to construct sewage disposal plants, one of the first things to be considered by the engineers in charge is to separate the domestic sewage from the storm-water. Separate systems of sewers are constructed for this purpose, the old system of sewers being retained for either the storm-water or the domestic sewage, as occasion requires or conditions dictate. In cities, on the other hand, where sewer systems are being originally constructed, from now on they will no doubt be built on the separate plan, unless the city is so peculiarly and favorably situated that it can dispose of its sewage without purifying it.

When separate systems of sewers are constructed, then, or where they are planned for the future, two modifications of plumbing work within the building must be borne in mind by the framers of the plumbing code. Yard and area drains must be gathered together into a separate and distinct system of drainage, to be discharged into the storm-sewers, and only the waste water from the plumbing fixtures discharged into the sanitary or house waste sewers. In the second place, owing to the relatively small sizes of the sanitary sewers, and the comparatively poor flushings they receive, the effort ought to be made to intercept all grease which is in liquid form, before it reaches the sewers. If the grease is not intercepted, it will cause untold trouble to the sewer department, in many cases accumulating to such an extent as completely to obstruct the sewer. Grease-traps are generally used to intercept the grease and prevent it from reaching the sewer mains. These may be individual interceptors placed under each sink or other fixture into which greasy water is thrown, or may be in the form of a brick, concrete or earthenware catch-basin located in the yard. In many cities having separate sewers, the catch-basin plan is followed, and the waste from all the kitchen sinks on the premises discharged therein.

A grease-trap or catch-basin is, really, a small septic-tank, although the good office it performed was not formerly well understood. It was supposed that the grease in the water floated to the surface of the water in the trap, becoming separated from the water when it became chilled, and rising to the top, where it formed a thick crust or cake, and remained until removed by mechanical means. Even to this day there are cities where workmen go around periodically with a scoop and remove this top scum. As a matter of fact, however, if left alone undisturbed, the catch-basin is better, and will perform its function in a much better form. In operation, the grease-trap not only separates the grease from the water, but it separates many other particles carried in suspension. Some of these, in obedience to the laws of gravity, sink to the bottom of the receptacle, and form a sludge; other particles float to the surface, leaving the intermediate space comparatively clear. The matter intercepted in the trap, all of which is of organic nature, is quickly seized upon by the micro-organisms present in the trap or basin, and a process of reduction follows, so that, if properly proportioned, it is quite possible the grease-trap would seldom have to be cleaned, provided the fixtures discharging into it were properly used and not abused. I remember being called upon one time to inspect the waste-pipe from a sink in a large institution which had just been completed. Word was received that the pipe had fallen apart, a seeming impossibility, as the work was new, and put in by skilled workmen. Investigation revealed the facts that the plumbers who did the work, in order to make an ornamental finish, had connected the trap to an extension-piece of the waste-pipe by means of an invisible joint, which of course not having much

body of solder would be readily melted. The cook in the institution had been frying crullers that day in deep fat or lard; and, having completed his task, had poured the boiling hot lard in the sink. The result was, the entire waste-pipe from sink to catch-basin was one solid mass of white lard, and the heat had been so intense it melted the solder at the invisible joints, allowing the pipe to fall apart. Even the grease-trap was so full of lard that it had to be cleaned, and there is little doubt but that a round wiped joint would have failed under the circumstances.

That is an abuse of plumbing fixtures, plumbing systems and grease-traps that is not contemplated nor provided for by architects, plumbers or codes. If hot lard in such quantities is poured in institution-sinks, it will cause trouble, no matter what the form or design of plumbing. It is only to intercept the grease in water from the washing of dishes, cooking utensils and like sources that grease-traps are provided, and if given intelligent care and use, they will fulfill their functions admirably until some better means of accomplishing the same purposes is found. Let us, then, in preparing each new code, take into consideration the system of sewers that is to be used, and the character of the building that is going to discharge its sewage into the sewers. If a separate system in sewers is contemplated, then the code should make provision to have the waste-water from all kitchen and scullery sinks pass through a grease-trap or catch-basin; and, whether the system of sewers is the combined or separate, a grease-trap or catch-basin should be required for every hotel, hospital, sanatorium, asylum, boarding-school or like place where food for many people is prepared in a common room.

Of the four cities used in these articles as examples, only one, New Orleans, has anything to say about grease-traps. Sections 76 and 77 of the code provide: "Grease-traps shall be used in hotels, restaurants, and places where a large amount of cooking is done. If practicable, they shall be placed in the yard, and they shall be of sufficient size and properly covered. When placed in the yard, they shall be constructed of concrete, composed of best cement and gravel, one part cement to three of other materials, or of some other equally serviceable materials. When not placed in a yard, a grease-trap provided with water-jacket shall be placed under each such sink. Pantry and kitchen-sinks in dwelling-houses may, at the option of the property-holder, have a grease-trap of iron, brass or lead; such traps shall be at least 8 in. in diameter and 12 in. high, with brass screw-plate to clean out same."

(To be continued.)

He Wasn't Speaking.

Small Man (in a Pullman car, writing a letter to his wife)—It would afford you some amusement, my dear, if you could see the freckle faced, long, lean, gamble shanked, knock kneed, sneaking, impertinent, ill bred, half baked specimen of a backwoods gawky that is looking over my shoulder as I write this—

Large Man (on seat behind fiercely)—You lie, you little scoun—

Small Man (turning round)—Beg pardon, sir, are you speaking to me?

Large Man (confusedly)—Y—no! No! I didn't say anything. I wasn't speaking. I—I—

Small man resumes his writing. Large man goes to the last seat and relieves his mind by saying something to the flying landscape.

New Ulm, Minn.—Chas. Emmerich has recently installed a modern plumbing system for Theo. Thormodsen in his farmhouse near Hanska.

NEWS FROM OHIO.

Columbus.—According to the custom which has been followed for a number of years, Samuel A. Esswein, president of the Samuel A. Esswein Heating & Plumbing Co., West Broad street, will give a banquet to all of his employees December 23, when a number of speakers will respond to toasts.

Canton.—Plans for a new and larger sewage disposal plant took real shape at a recent meeting of the city council, when the sum of $3,100 was appropriated for the purpose of buying a site upon which to erect the plant. The present plant is inadequate to the needs of this growing city.

Cleveland.—The Schneider Plumbing Co. has secured the contract for the plumbing in the new central Y. M. C. A. building.

HERE AND THERE IN THE PLUMBING AND HEATING TRADES.

Saginaw, Mich.—Chas. J. Martin finds his hands full these days. Among other jobs, he has recently installed plumbing in 10 houses for Mrs. T. Nicholls; eight houses for J. Sonnenberg; five for Mrs. Chas. Harris; three for Wm. Hesse; four for L. Clinkofstine; two for Geo. Vanderhoof, and four for Wm. Rank, as well as having many individual installations and repairs.

Spokane, Wash.—The Arnold Evans Co. has the contract for installing the heating plant in the public library. Its bid was $1,174, which was much less than other bids submitted.

Iowa City, Ia.—C. M. Huff's plumbing establishment is now located in the Dunkell building, at the corner of Capitol and College streets.

Reading, Pa.—John D. Corbin has been appointed plumbing inspector by Mayor-elect Stratton.

La Fayette, Ind.—Ed. R. Overesch & Co. is the new name over the well known plumbing establishment conducted for many years by Ed. R. Overesch. The new partner is Wm. M. Headson, formerly foreman.

Bad Axe, Mich.—John Maywood & Sons have recently piped Fred Witteman's store for steam heat, to be furnished from the Temple building.

Corbin, Ky.—W. W. Sawyers, an experienced master plumber of Barbourville, Ky., has decided to open a branch establishment here.

Lawrence, Kans.—Graeber Bros. have the contract for plumbing and heating the new Santa Fe depot at Pratt, Kans.

Alliance, Neb.—C. A. Newberry will install a heating plant in the Scott's Bluffs' public school.

Devils Lake, N. Dak.—The Devils Lake Plumbing & Heating Co. has the contract to install plumbing, heating and electric wiring in the new fire hall.

Aurora, Neb.—Schrandt & Miller have purchased the plumbing stock and good will of Mossholder & Fletcher, who have retired from active business.

Dickinson, N. Dak.—The partnership which has existed between Frank J. Smith, A. L. Smith and Clarence Eldred, under the name of the Smith Heating & Plumbing Co., has been dissolved. All accounts will be settled by F. J. and A. L. Smith.

Evansville, Ind.—The H. G. Newman Plumbing Co. has taken a large contract for steam heating, ventilation and plumbing for the junior high school. This work amounts to $26,000 and when finished this school will have equipment second to none. The boiler capacity will be 450 h. p. for heating and power, making it one of the largest independent plants in the middle west. This firm is now completing the heating system in the new Woods office building, De Jong's new store and Strouse & Bros. Work finished recently includes the four-story McAtee-Ray department store, Owensboro, Ky., a three-story store for W. J. Dulin, Madisonville, Ky., and 8-room school at Morganfield, Ky., and several residence jobs.

Rock Island, Ill.—Mayor Carlson has lately appointed City Physician Perry Wessel and C. A. Berglund as new members of the board of examiners of plumbers. The third member of the former board, Plumbing Inspector A. P. Peterson, retains his position on the newly-appointed board.

PIPING AN INJECTOR.

By W. H. Wakeman.

An amateur steam-fitter piped up an injector so that it cannot force water into the boiler, and left it in that condition. Although the defect is plain to every engineer and expert steam-fitter who sees the job, still a description of the cause of trouble, and a reliable remedy may help others to avoid similar mistakes.

Fig. 1 is an elevation of this injector and the connecting pipes, and Fig. 2 is a plan of it. In these illustrations like figures refer to the same parts, hence the description can easily be followed. The pipe 2 delivers water from the street-main under pressure to the injector, which forces it out through 3 and 4 to the check-valve and feed-valve, shown in Fig. 2, to the boiler, or at least that was the intention, but this desirable result could not be secured, hence the injector has never been used. A steam-pump supplies the water required, but this can only feed cold water when the engine is shut down, and if it should fail to work, the plant would be disabled.

It was necessary to provide means for filling the boiler after it had been cleaned and inspected, as it was not practical to run water through the injector because the passages are too small. A tee was connected into the pipe at 5, also an ell and tee at 6 for this purpose. It is plain that this will permit the boiler to be filled rapidly, but after it is filled to the proper height, and steam is raised to a working pressure, no more can be forced in, because it simply circulates through the pipes, as shown by the arrows in Fig. 2.

The engineer wanted to put a check-valve in this cross-pipe, which was not difficult as a union at 7 provided

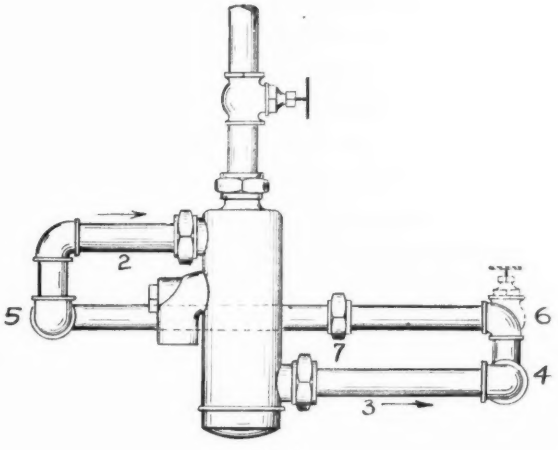


Fig. 1.

means for disconnecting the required pipes easily, but it is not advisable to use a check-valve here, although it would answer the purpose for a greater portion of the time. My objection to a check-valve in this case is that it will only be used occasionally, hence is liable to become foul with corrosion until it will not hold water. In such a case nothing can be done with it until there is a chance to remove all pressure and clean the valve, and in the mean time the leak may be sufficient to prevent the boiler from getting water to supply the required steam.

It is better to put in an angle-valve as shown by the dotted lines at 6, Fig. 2, as it can then be kept securely closed until water is wanted through it. If it leaks, it may be caused by rust, or some other foreign substance on the seat, hence if the valve is opened while the injector is working the seat may be cleaned by the rush of

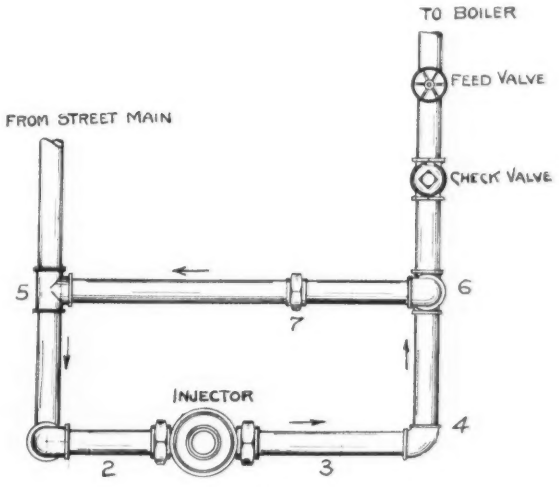


Fig. 2.

water over it. This is done many times in practice, therefore it is always better to open a leaky valve before closing it tighter, as this precaution may prevent the seat from being spoiled.

Another advantage of using an angle-valve is that in making the change it is only necessary to unscrew the union-nut, disconnect the ell, and put the valve in its place, as no cutting of pipe is required. This does not seem to be much gain, when we are in a steam-fitter's workroom, filled with pipe, nipples, etc., but in such plants in which we frequently find injectors with no convenience for making changes and repairs, it is worth considering.

Father says that we must get
Close together - Closer Yet !
Association wide awake -
Come and see it at Salt Lake.

LEGAL DECISIONS

VALIDITY OF LIMITED LOCAL OPTION PLUMBING LAW AND OF CITY ORDINANCE.

In the habeas corpus case of Ex parte Smith, 132 Southwestern Reporter, 607, the petitioner was fined $10 in the police court of St. Louis, and imprisoned in the St. Louis workhouse for carrying on the business of a plumber without having been licensed as required by an ordinance of said city numbered 23,007. The specific charge was for a violation of sections 5 and 10 of the said ordinance. Section 5 provides that upon satisfactory proof of the qualifications and fitness of the applicant for a plumbing license, a board of examiners of plumbers shall issue to him a certificate, which shall entitle him to engage in or work at the business of plumbing for a period of one year. And no person shall be entitled to obtain from said board a certificate of qualification as master or employing plumber or journeyman plumber except as in the ordinance provided who shall not first have passed a satisfactory examination before said board as to his knowledge, experience, and skill in practical plumbing, house-draining, and plumbing ventilation. Section 10 provides a penalty of not less than $10 nor more than $100 for any person who shall engage in the business of plumbing in said city without having been duly licensed as required by the ordinance.

The petitioner claimed that this ordinance was founded for its authority on the plumbing act of the legislature approved March 27, 1903, and that said act was unconstitutional because it was local and special and because it was in violation of the petitioner's constitutional right to life, liberty, and property. He also insisted that the ordinance was outside of the charter and statutory powers of the city of St. Louis, and was unreasonable, and therefore void.

Taking up first the question of the validity of the plumbing act of March 27, 1903, the supreme court of Missouri, division No. 2, says that the title of the act declares it to be a law "to require the registration of all plumbers in all cities of this state having a population of more than 50,000 inhabitants, and to provide for a board of examiners of plumbers therein," etc., but by section 13 of the act "the provisions of this act shall be inoperative until adopted by proper ordinance by the city or town to which it relates." In a word, in effect it is a local option statute which can only become a law when a particular city makes it operative therein. Until a city of the class mentioned adopts it, it is a dead law, and it is only when the city by proper ordinance does adopt it that the act itself and its penalties as state enactments for the first time come into effect and being. In a word, this act was not a complete law when it left the hands of the legislature.

In State vs. Railway Co., 195 Mo. 245, it is said: "Local option laws have often been held to be constitutional in this state where the laws themselves were complete enactments when they left the legislature, and did not depend upon any outside authority to make them laws. But local option laws—that is, laws passed by the state—which may or may not be taken advantage of and utilized as the people of each locality elect so to do or not, must apply to the whole state, and must confer upon the people of each locality a privilege of taking advantage or not of those laws as they see fit. A local option law that authorizes the people of only a limited portion of the state, or of every portion of the state except specified parts thereof, to avail themselves of it is not a valid law, for laws must be made by the legislature and must be co-extensive within the territorial limits of the state in respect to the powers conferred or the burdens imposed."

The language of this act of 1903 on its face provides that it shall not be operative until it is adopted by the city or town to which it relates, and thus takes it out of the reasoning upon which local option laws have been sustained. And, in the court's opinion, the act is clearly unconstitutional and void; nor can section 13 be rejected, and the enactment thus saved. That section gives character to every part of the act, and, in the court's opinion, the act never would have received the approval of the legislature without that section in it, and yet there is not the slightest hint of such a radical change in the character of the bill from that indicated in the title.

But this act was never adopted and made operative in the city of St. Louis, and consequently could form no basis for the ordinance which was assailed by the petitioner in this case. Then, with the act out of the way, was the ordinance a valid exercise for the charter powers of the city of St. Louis? Under its charter the city has large powers to license and regulate trades and avocations, but it was insisted by the petitioner that because plumbers are not specifically named the city has no right to license and regulate their business.

The opinion of the court is that, under its charter, the city has the power to license and regulate the business of plumbing, unless, in so doing, it violates the constitution of the state in interfering with the constitutional right of the petitioner to his natural rights to the enjoyment of the gains of his own industry, and deprived him of his property without due process of law. The natural right to health, liberty, and pursuit of happiness secured by the state constitution and bill of rights is not an absolute right. The individual must sacrifice a part of his particular interest if the sacrifice is a necessary one in order that organized society as a whole shall be benefited. The restraint of personal action is justified when it obviously tends to the protection of the health and comfort of the community, and the individual's constitutional right is not thereby violated. While there may be some cases to the contrary, the great weight of authority in this country is to the effect that the business of plumbing is so intimately connected with the public health, especially in large centers of population where scarlet-fever, typhoid-fever, diphtheria, and other diseases are apt to become epidemic, as to be the proper subject of police regulation. The right of a citizen under the Missouri constitution to follow any legitimate business, occupation, or calling which he may see fit to engage in, and to use such right as a means of livelihood, is fully secured, but it is subject to the paramount right of the state to impose upon the enjoyment of such a right a reasonable regulation which the public welfare may require.

The court regards the business of plumbing as so intimately connected with the public health and the comfort of the citizens that there ought not to be any doubt that its regulation falls within the power of the legislature in the exercise of its police power. The ordinance under

consideration does not restrain individuals from working as plumbers, it simply requires that the man who holds himself out to do this important work shall be fitted for it, and the ordinance imposes no unreasonable burden upon him. In this connection it need only be stated that it has been decided in various cases in this court that a charter power of a freehold city like Kansas City and St. Louis under the Missouri constitution has all the sanction of a legislative enactment by the legislature. The court is of the opinion that the ordinance was clearly within the powers of the city conferred upon it by its charter, and that it is a perfectly reasonable regulation. That the fee in this case is a mere license fee, being $1 per year, the court thinks is too obvious for any discussion. It is not a tax in any sense of the word, nor is it intended as such. Its amount on its face demonstrates that it is simply enough to cover the proper charges for the issuing of the license certificate.

The contention that the ordinance conflicts with the fourteenth amendment to the constitution of the United States, which provides that "No state shall pass any law denying to persons the equal protection of the laws, nor deprive any person of life, liberty or property without due process of law," is, the court thinks, without basis. The ordinance applies alike to every person, whether master or employing plumber or journeyman plumber, and operates equally upon all who come within its provisions. Certainly the ordinance does not operate unjustly against the plumbers of other cities in Missouri. Section 7 thereof provides for the issue without examination or examination fee of a certificate to every plumber desiring to work at or engage in the business of plumbing who has been duly licensed by the examining board of any other city in the state. And this right has been accorded them by the city.

In the court's opinion the petitioner was properly convicted for working at the business of plumbing without first having been licensed, and accordingly it is ordered that he be remanded to the custody of the lawful keeper of the workhouse of the city of St. Louis.

VALIDITY OF CONTRACTS TAKEN BY OTHERS THAN LICENSED PLUMBERS.

The second appellate division of the supreme court of New York says that the case of Putnam vs. Siravo and another, 124 New York Supplement, 1105, was brought to foreclose a mechanic's lien. At the opening of the case for trial, the defendants moved to dismiss the complaint, upon the ground that there was no allegation contained therein that the plaintiff was a duly licensed and registered plumber under the laws of the state, and on the further ground that there was no allegation contained in the complaint that prior to the commencement of the work the plans and description thereof were filed in the department of buildings of the city of New York, or approved by the superintendent of buildings, as required by chapter 803 of the laws of New York of 1896. The motion was granted, but the judgment dismissing the complaint is here reversed, and a new trial granted.

The complaint alleged that the plaintiff agreed with the defendants "to perform or procure to be performed all the labor and furnish or procure to be furnished all the materials necessary" for such plumbing, heating, and electric lighting. This was the allegation of a valid contract, irrespective of whether the plaintiff was a licensed and registered plumber. It was then alleged that the plaintiff entered into a contract with one Howarth for the performance of all the plumbing work, who did the same, and that he was a duly licensed and authorized plumber, and had complied with all the requirements of the laws of the state of New York, the ordinances of the city of New York, and rules established by the building department of said city relating to the licensing and registration of plumbers. A lawful contract and its due performance were stated in these allegations, and it was not necessary that the plaintiff should allege that he himself was a duly licensed and registered plumber. A person may lawfully contract to procure the performance of this class of labor, and, if he procures its performance by a duly licensed and registered plumber, the fact that he himself is not licensed and registered as a plumber furnishes no defense to his action for his contract compensation. He is not an employing or master plumber, carrying on his trade, business, or calling in the city of New York, but a citizen, who has contracted to procure plumbing work to be done by a licensed and registered plumber, and his subcontract with such a plumber for the performance of such work does not bring him within the condemnation of the statute.

December 13 and 14, 1911.—The annual meeting of the National Association of Brass Manufacturers, in New York City. Headquarters at the Hotel Astor. The commissioner of this association is Wm. M. Webster, 64 W. Randolph St., Chicago.

January 23, 24 and 25, 1912.—The 18th annual meeting of the American Society of Heating and Ventilating Engineers, at the Engineering Societies Bldg., 29 West 39th St., New York City. The officers of the society are: President, Reginald Pelham Bolton, New York City; first vice-president, Prof. John R. Allen, p. t. Constantinople, Turkey; second vice-president, A. B. Franklin, Boston; secretary, W. W. Macon, 29 West 39th St., New York City.

January 24 and 25, 1912.—The 20th annual convention of the Illinois Master Plumbers' Association, at Decatur, Ill. Headquarters will be established at the St. Nicholas Hotel. The officers of the association are: President, F. U. Patterson, Springfield, Ill.; vice-president, Wm. J. Hilliard, Elmhurst, Ill.; secretary, W. C. Haviland, Aurora, Ill.; treasurer, Thomas Cody, Peoria, Ill.

May 14-17, 1912.—The sixth annual convention of the Master Boiler Makers' Association, at Pittsburgh, Pa. Headquarters will be established at the Fort Pitt Hotel.

June 25, 26 and 27, 1912.—The fourth annual meeting of the National District Heating Association, in Detroit, Mich. The officers of the association are: President, A. D. Spencer, Detroit, Mich.; first vice-president, Warren Partridge, Springfield, Ill.; second vice-president, R. D. de Wolf, Rochester, N. Y.; third vice-president, Cadwallder Evans, jr., Pittsburgh, Pa.; secretary-treasurer, D. L. Gaskill, Greenville, O.

Fishing in Palestine.

One of Private John Allen's favorite stories is about a Georgia bishop.

One of the members of the bishop's church met the reverend gentleman one Sunday afternoon and was horrified to find the bishop carrying a shotgun.

"My dear bishop," he protested, "I am shocked to find you out shooting on Sunday. The Apostles did not go shooting on Sunday."

"No," replied the bishop, "they did not. The shooting was very bad in Palestine and they went fishing instead."—Cleveland Leader.

THE RABBIT-LIKE BOILER QUESTION ONCE MORE.

Editor "Domestic Engineering":—For the benefit of "Drury Lane" I will admit that I was funning, but there was method in my funness as my object was to arouse the trade from a condition of blind confidence in the dope of its favorite manufacturer.

Because of the small number who are disposed or have time to determine the underlying principles of the laws governing the phenomena encountered in the heating game, it is desirable that practical men should discuss these principles through the medium of the trade-press that the trade in general may profit thereby. The dearth of publications that get down to the kernel and plainly tell the how, and why, influences me to start the ball rolling. True, we have hundreds of volumes of beautifully compiled data, a close inspection of which breeds contempt. The data is not sufficiently definite to be of any value to the student.

There are certain things that we must know in order to determine the proper installation under given conditions.

1. The number of B. t. u. transmitted per sq. ft. of radiation per hour.
2. The number of B. t. u. absorbed by each sq. ft. of the boiler's heating-surface per hour.
3. The rate of combustion that will give the most economical results.
4. The ratio of heat-absorbing-surface to grate-surface that will assure the minimum fuel-consumption.
5. The type of boiler best suited to the conditions.
6. The efficiency of boiler.

The data by experts for item No. 1 varies from 225 to 399; for No. 2, from 1,800 to 6,700; No. 3, 2 lb. to 13 lb. per sq. ft. of grate per hour; No. 4, from 8 to 1 to 20 to 1; No. 6, from 30 per cent to 125 per cent.

All these varying data are possibly correct for one particular condition, but we must know the correct data for the average condition and what consitutes the average condition, or what it should be.

To get the question before the house, I submit the following, trusting that a discussion will determine something definite that will prove a safe guide for installation when soft coal is used.

B. t. u. transmitted by a sq. ft. of all radiation except window, 250.

Window radiation, 280.

B. t. u. absorbed by each sq. ft. of heating-surface, average, 3,000.

Average consumption of fuel per sq. ft. of grate per hour, 3½ lb.

Maximum consumption of coal in extreme weather, 6 lb.

Ratio of heating-surface to grate-area in square boilers now on market, from 10 to 1 to 12 to 1; round boiler, 8 to 1 to 20 1.

Boiler essentials: Large water-ways, large flues, maximum percentage of surface in line of flame-travel, maximum amount of heating-surface obtainable and consistent with proper flues and internal circulation, up to capacity of the chimney.

Efficiency of present boiler types: 30 per cent to 50 per cent, as operated in the average job.

As a practical illustration of the use of this data, let us take a 2,000 ft. gravity-steam job with no window radiation and the maximum load on the basis of fuel consumption of 6 lb. per sq. ft. of grate per hour in extreme weather, dictating the size of the boiler.

Two thousand sq. ft. of radiation would require 2,000 x 250 or 500,000 B. t. u. per hour. If each sq. ft. of heating-surface will absorb 3,000 B. t. u. per hour, then the absorbtion of 500,000 B. t. u. will require 166 sq. ft. of surface. The average square boiler with the ratio of heating surface to grate of 12 to 1 will show a 50 per cent efficiency; therefore, to get the necessary grate surface for coal having 12,000 B. t. u. per lb. we have

$$\frac{500000}{(12000 \times 50\ \%) \times 6} \text{ of 14 sq. ft. of grate.}$$

One prominent manufacturer rates this size boiler at 3,150 ft., while another shows 3,875 ft., but these printed figures do not necessarily change the capacity. The draft-conditions would vary these results to a certain extent but would a careful, conservative fitter consider this a fair load for the boiler under ordinary conditions? Check up some of your best working jobs and see how they compare with these estimates. I know no better way to get at the facts.

Now let us take a smaller job where we can use a round boiler with varying ratios of heating-surface to grate not found in square boilers. With an 8 to 1 boiler we could possibly secure a 40 per cent efficiency; 12 to 1, 50 per cent; 16 to 1, 55 per cent; and 20 to 1, 60 per cent, but the exact result would depend largely on the draft-conditions. The boiler with the higher ratio would stand a higher rate of combustion and show increased efficiency, providing that it was attached to a chimney that would handle it. It is evident that an architect perscribes the limits of the efficiency of a heating plant when he designs the flue. Theoretically a 500-ft. job would figure out as follows and the draft conditions would dictate whether to increase or decrease the grate to correspond with stock sizes.

12 to 1 boiler: $\frac{125000}{(12000 \times 50\ \%) \times 6}$ or 3 4/10 ft. grate

and $\frac{125000}{3000} = 42$ sq. ft. of surface.

16 to 1 boiler: $\frac{125000}{(12000 \times 55\%) \times 6} = 3\ 1/10$ ft. grate

and $\frac{125000}{2500} = 50$ sq. ft. surface.

20 to 1 boiler: $\frac{125000}{(12000 \times 60\%) \times 6} = 2\ 8/10$ ft. grate

and $\frac{125000}{2100} = 60$ sq. ft. surface.

Increasing the amount of heat-absorbing surface necessarily decreases the average rate of absorption, while a higher rate of combustion increases it, as the temperature difference governs in either case.

"Domestic Engineering" Cartoon on "False Boiler-Ratings"—LVI.

The Little Girl Who Was Lost.

WHOSE LITTLE GIRL ARE YOU? SHE'S RATED HIGH BUT SHE HASN'T ANY TRADE MARK!
HER FACE IS ALL RIGHT BUT I'M DOUBTFUL OF HER FIGURE
GUESS I'M NOBODY'S LITTLE GIRL
I AIN'T GOT NO U'SE FOR LITTLE GIRL'S WITH EXTRAVAGANT RATINGS! THEY'VE STUNG ME BEFORE!
CONSUMER
ARCHITECT
RATED AT 1000,000.
STEAMFITTER
DOMESTIC ENGINEERING

Whose Little Girl Are You?

If you want to possess a special proof of this or any other of our cartoons, let us have your request at once. We have many applications for our cartoons for framing and want to take good care of all demands made.

If on a given job a different boiler will save 20 per cent of coal, it is worth our while to study this question.

I am aware of the fact that certain interests advocate round boilers with low ratios and high profits per pound, but the consumer pays the freight.

Improper installation has played havoc with the heating business, hence I feel that the adoption of some method such as I have outlined would be of great benefit to the trade and not only deliver us from the evil of the "Catalog-Rating Con Game," but force the manufacturer to furnish boilers better adapted to our needs.

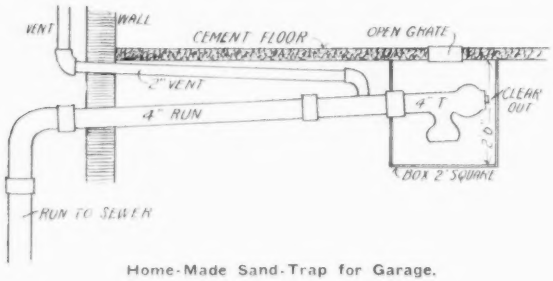
In discussing this question, please bear in mind that the grate-area governs the amount of coal we can burn and the amount of heat we can generate, while the amount of heat-absorbing surface governs the amount of heat we can transmit to the radiators, for each sq. ft. certainly does have a certain absorbent capacity, and it therefore follows that the more surface we have the greater percentage of the heat generated will be utilized and the more there is utilized the less will be the stack-loss. The amount of surface we can use in a properly constructed boiler is governed only by capacity of the chimney, and within reasonable limits the efficiency of the heating job is up to the architect, as h usually dictates the chimney construction.

B. O. Iler.

HOME MADE SAND-TRAP FOR GARAGE THAT WORKS ALL RIGHT.

Editor "Domestic Engineering":—Referring to a question that was asked about a sand-trap in a garage, in the November 11th issue, I put one in like this sketch (Fig. 1) and it worked all right.

The sand-box is 2 ft. square at top, and 2 ft. 6 in. deep, and is built of cement. A tee is looking down into



Home-Made Sand-Trap for Garage.

the box with a cleanout in the end, and the run is 4 in., running into the sewer. A 2-in. vent is taken off next to the tee and run back to the wall and then up.

This is only a rough drawing, but it will give any one an idea how to put one in. This was built for a garage washing about five or six machines daily.

San Jose, Cal. J. Kelly.

SCARCITY OF WATER IN APARTMENT BUILDING.

Editor "Domestic Engineering":—In a certain apartment building that I have been called upon for an opinion as to the cause of the trouble, the water at times does not seem to come to all the faucets. When no one is drawing, it will run well from any faucet on any floor. Perhaps it will run all right if four or five are drawing, but let 10 or 12 (it is a 20-apartment building) be using the water at the same time, and in some places the water will not come. Can you tell me what to look for?

St. Louis, Mo. James Allen.

It might be that the pressure was not very strong at the time the parties were all using the water. If there is a scarcity of pressure, a tank on the roof of the building or a pneumatic supply tank in the cellar would doubtless remedy matters. Have you examined the supply-pipe lines to see if they are large enough? In this case the main ought not to be less than 1½ in. What is the size of the supply from the street? We were in a building the other day where the owner had experienced the same difficulty. He had a 2-in. main in the building. Sometimes the tenants on the top floor could not get water. He traced the line down to the point where the pipe came through the wall from the street and found nothing. Not satisfied, he went on the outside and dug down. When he came to the pipe, he found that the supply from the main came nearly up to the house in a ¾-in. pipe which just outside the wall had been increased to 2 in. A 2-in. pipe with taps sufficient to supply the same made his job work all right as far as the amount of water furnished was concerned. We advise you to examine your job, bearing in mind his experience.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., Jan. 9, 1912, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Mattoon, Ill. The building has approximately 6,000 sq. ft. of ground area, one-story, basement and mezzanine.

Until 3 p. m., Jan. 10, 1912, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring and interior lighting fixtures, of the U. S. post-office at Gaffney, S. C. The building is one-story and basement, with a ground area of approximately 4,200 sq. ft.

Until 3 p. m., Jan. 12, 1912, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and interior lighting fixtures, of the U. S. post-office at Mansfield, O. The building will have two stories and basement, with a ground area of approximately 7,000 sq. ft.

Until 3 p. m., Jan. 13, 1912, for the construction complete, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and interior lighting fixtures, of the U. S. post-office and court-house at Bismarck, N. Dak. The building will have three stories, basement and unfinished attic, with a ground area of approximately 6,400 sq. ft.

All proposals should be in accordance with drawings and specifications, copies of which may be obtained from the custodians of the above sites or from the office of the Supervising Architect at Washington, D. C.

A Fever Register.

A hot-air plant was installed in a small church in Tennessee where stoves had been used. On the first Sunday night after the new furnace was in operation a widow came to services accompanied by her son, a tall and gangling youth who suffered from the breakbone ague of the district.

It so befell that they took a pew directly over one of the registers in the floor. Down in the basement the janitor began to fire up.

The boy stood it for a while. Then he nudged his parent.

"Ma," he whispered, "I got to go home. I'm gittin' sick agin."

"How do you know you air?" asked his mother.

"I kin feel the fever coming up my laigs."

Sewer Ventilation and the Intercepting Trap

A Paper by F. J. H. Coults, M. D., B. Sc., D. H. P., F. C. S., Read Before a Sessional Meeting of the Royal Sanitary Institute, Held at Blackpool, England

The subject of sewer ventilation has been so frequently a matter of discussion at meetings of The Royal Sanitary Institute, and other bodies interested in preventive medicine, that I daresay many of you will think that it is entirely worn threadbare. Perhaps, therefore, I may be allowed to offer some apology or justification for bringing such a hackneyed subject before you at this Provincial Sessional Meeting of the Institute.

First:—I might premise that it is not very easy to find subjects for discussion of real importance which are equally interesting to the engineer and to the medical officer of health.

Secondly:—The question of sewer ventilation is of such vital importance, that so long as there is in regard to it any marked difference of opinion among sanitarians, it must constantly crop up for discussion. As you well know, we are very far indeed from absolute agreement, and until something resembling unanimity is obtained among those specially versed in sanitary matters, we cannot be surprised if local authorities object strongly to carry out schemes which may be recommended to them, especially if they involve considerable expenditure.

Thirdly:—In my opinion very important new light has been thrown on the subject by some interesting and valuable experiments recently recorded, and I consider it would be distinctly of advantage to have the matter threshed out again so that the bearing of these new facts may be realized and our mental attitude to the subject readjusted, if necessary, to somewhat changed conditions.

I am not sanguine enough to believe that the present discussion will finally solve the problem and lead to that unanimity of opinion which is so highly desirable, but the presence here of eminent and distinguished men who have given much time and thought to this subject leads me to hope that I along with others may derive much benefit and instruction from it.

Our attitude towards the question of sewer ventilation is, of course, very greatly influenced by the views which we hold as to the dangers threatened by "sewer-air" or "sewer-gas."

Apparently as far back as Roman times a strong opinion was held as to the dangers of sewer-gas, for I have seen it stated that in Justinian's Digest, A.D. 535, the following words occur:—"The Prætor took care that all sewers should be cleaned and repaired, for the health of the citizens, because uncleaned or unrepaired sewers threaten a pestilential atmosphere, and are dangerous."

But in more recent times very considerable doubt has been thrown upon the power for evil of sewer-air, although most people have appeared to agree about the potential harmfulness of "sewer-gases," the latter term being used to denote gases given off by stagnant and decomposing sewage. The experiments which seem to have influenced most strongly recent views were those of J. Parry Laws and Dr. Andrewes on the micro-organisms of sewage and sewer air, which appeared to indicate that sewer-air had no power of taking up bacteria from the sewage with which it was in contact, and that, bacteriologically, the air of sewers was no worse than that of the street above, and that, in fact, the number of micro-organisms found might actually be less, whilst the types of germs were precisely those present in the external air, and not those of sewage. They never found the *Bacillus coli communis* in sewer-air, although it is present in such enormous numbers in sewage, and they thought the possibility of the existence of the typhoid bacillus in the air of sewers was infinitely remote.

The full deductions from these results were too startlingly different from the teachings of practical experience to allow them to be accepted unconditionally or to bring us to the stage of recommending to our patients a sojourn in a sewer chamber, as an alternative to a visit to Blackpool or some other health resort. Nevertheless, these experiments have undoubtedly led to a considerable amount of uncertainty, and many people have gone so far as to controvert entirely some of the older views as to the connection of diphtheria, typhoid fever, scarlet fever, septic sore throats, etc., with the inhalation of sewer-gas.

Their reasonings have, however, failed to convince many of us as to the innocuousness of sewer-air. Personally, I have been strongly impressed by the firm opinions held by many shrewd and careful observers who have had long experience in general medical practice, and who have unhesitatingly expressed their belief that certain forms of disease are induced, directly or indirectly, by exposure to sewer-gases. Several have recorded their opinion that typhoid fever is undoubtedly caused sometimes by inhalation of sewer air. In these very scientific days we are apt to look down with undue contempt on the views held by our forefathers, forgetful of the fact that some of them enjoyed wide experience and had been trained in the habit of close observation, which was all the more necessary before the advent of those aids to diagnosis which are now at the disposal of every doctor.

The conclusions of Laws and Andrewes have not gone entirely uncontradicted. Even before their researches, Professor Frankland, in 1871, showed that although liquids flowing smoothly along gave off no solid particles to the air, yet the bursting of bubbles of gas in a liquid had a marked effect in allowing the dissemination of solid particles. Several later observers, although confirming generally the experiments of Laws and Andrewes, as far as regards the types of bacteria found in the air of sewers, at any rate where the sewage was fresh and not putrescent, do not altogether agree with the conclusions deduced from those experiments.

The most remarkable set of recent experiments on the subject which have come to my knowledge are those of Major W. H. Horrocks, R.A.M.C., recorded in a paper read before the Royal Society, and published in "Public Health" for May, 1907, under the title, "Experiments Made to Determine the Conditions under which 'Specific' Bacteria Derived from Sewage may be Present in the Air of Ventilating Pipes, Drains, Inspection Chambers, and Sewers." It is in this paper that the new facts arise which I think should be carefully studied in any fresh consideration of the sewer-ventilation question.

As this paper does not seem to be so well known as I think it deserves, some description of Major Horrocks' well-planned and carefully managed experiments may be welcomed.

In his first group of experiments, sewage inoculated with a rich growth of *B. prodigiosus* was placed in the bottom of a deep glass-jar; four inches above the surface of the sewage, Petri plates of nutrose agar were placed,

and the surface of the agar exposed to the air after the sewage had been agitated to form bubbles. No colonies of the *B. prodigiosus* were found on the Petri plates after incubation, and similar negative results were obtained with the typhoid bacillus. Therefore the conclusion to be drawn is that in the absence of air-currents, bacteria are not ejected to a height of four inches by the bursting of infected bubbles.

But very different results were obtained when air-currents were present. Petri plates suspended in the ventilating-shaft of an intercepting trap 9 ft. above the surface of soapy water containing the *B. prodigiosus* were infected readily, thus showing that currents of air passing up the vertical pipe could carry bacteria separated by the bursting of bubbles. Similarly, he found that bubbles rising naturally through stagnant water in a catch-pit may eject bacteria, which will be carried away by currents of air passing over the surface of the fluid. In his next experiments three 2-ft. lengths of 6-in. drain-pipe had a rich emulsion of *B. prodigiosus* poured into them and equally distributed over their inner surface. When the pipes were quite dry, they were arranged by clay-joints so as to form the vertical ventilating-pipe on a length of drain. Nutrose-agar plates were then suspended in the vertical ventilating-pipe and sewage allowed to flow along the horizontal drain for 20 minutes at a rate not exceeding 3 ft. per second. On incubation the plates showed colonies of *B. prodigiosus*. As the sewage passing through the horizontal pipes did not contain this bacillus, nor the outside air, it is reasonable to assume that the currents of air caused by the flowing of the sewage carried up dried particles of *B. prodigiosus* detached from the walls of the vertical pipes.

The next group of experiments were to determine whether specific bacteria were ejected into the air of sewers from sewage flowing under normal conditions.

The trap of a 6-in. disconnecting trap was filled with sewage. Petri plates were suspended in the vertical ventilating-pipe 6 ft. 9 in. above the sewage. Sewage containing typhoid bacilli was then allowed to flow down the drain on the house side of the trap, and collected from the drain on the sewer side of the trap. The rate of flow was regulated to be not more than 3 feet per second. Numerous typhoid germs were found on the plates. Similar experiments with *B. prodigiosus* were successful to heights of nearly 12 feet above the trap.

The next series of experiments were arranged to test the value of a disconnecting trap in protecting a house-drainage system from microbes in sewer-air. Pipes were arranged to represent a short house-drainage system, with an intercepting trap and vertical ventilating-pipe. Beyond that, on the sewer side of the trap, was another vertical pipe to represent a sewer ventilator. Plates of nutrose agar were suspended in both vertical pipes. Sewage containing *B. prodigiosus* was then allowed to flow along the pipes representing the sewer, at a rate not more than 3 ft. per second. Colonies of the germ were found in the vertical pipe representing the sewer ventilator, but none in that representing the ventilator on the house side of the trap. Even when the fluid in the trap was disturbed by a 3 gal. flush every 5 minutes no collection of *B. prodigiosus* were found on the plates on the house side of the trap, showing that the trap effectually protected the house drains from contamination from the sewer side. Removing the trap, but otherwise leaving the experimental system precisely as before, on pouring infected sewage down the sewer-pipes and flushing the house-drains by a three-gallon flush every five minutes the *B. prodigiosus* appeared in the ventilating pipe of the house-drains as well as in that of the sewer. These results show that a disconnecting trap prevents germs present in the sewer passing into the house-drainage system.

The next series of experiments are of very great value especially as they were made with actual and not experimental drainage systems. In a newly laid house-drainage system, plates were suspended in the disconnecting chamber, and a plate was fixed in front of the air inlet of the system (the low ventilator) which was furnished with a mica-flap valve. An emulsion of *B. prodigiosus* was placed in the pan of the house water-closet, which was then flushed out. When the plates were incubated colonies of the special germ were found on every plate. This result is significant of the inefficiency of the ordinary mica-flap valve. At a military hospital plates suspended in the top of a 6-inch ventilating pipe 50 feet above the ground level were infected when an emulsion of the *B. prodigiosus* was placed in the pan of a water-closet in the basement, which was then flushed out.

Another experiment was instructive, in which plates placed in an intercepting chamber (C) at one corner of a military hospital block became infected by bacteria flushed out of a water-closet pan at another corner of the block, although the sewage had to pass first through one intercepting chamber (B) and along a considerable length of sewer. The cause of this result was found in the stopper of the rodding arm of chamber C being missing; when it was replaced, plates in chamber C did not become infected. The only other experiment I need mention is one which proved that the typhoid germ itself could be carried from the surface of liquid in a trap up the ventilating pipe when stools from an enteric fever patient were allowed to flow through the trap. This shows that bacteria in their normal condition in infected sewage can be carried into the air just as the naked bacilli in the preliminary tests.

The results obtained by Major Horrocks will no doubt be tested by other experimenters, but I think that no one who closely studies the records of his experiments will fail to agree that they deserve serious consideration. Personally I feel satisfied that further experience will only serve to confirm these conclusions. Their bearing on the question under discussion is sufficiently obvious.

The simplest plan of dealing with sewer ventilation is, if I may venture on an Irish bull, to have no ventilation at all. This is the solution of the problem, I suppose, in certain towns such as Bristol and Cheltenham. But in such a case it is obvious that a sudden inrush of sewage, or a sudden expansion of sewer-air through the introduction of hot liquids into the sewer, or other cause, will lead to the breaking of the seals of the intercepting traps in the vicinity and the access of sewer-air into the house-drains. The gases will come out at the low vent, and if the drains are at all defective, there is a great tendency for the gases to penetrate into the house itself. We know that the difference of temperature between the interior of the house and outside is sufficient to draw any foul gases in the adjoining subsoil into the building.

Of actual methods of attempting to ventilate sewers, the easiest and cheapest is to provide surface-level openings in connection, either directly or indirectly, with the manholes. Probably more sewers have been laid on this plan than on any other. But common sense and actual experience tell us that these surface openings are frequently offensive and cause a nuisance. Horrocks' experiments give us good reason for believing that, in addition, they are a danger to health, and that disease germs may be inhaled by persons passing over such openings. I am under the impression that various safeguards which

have been proposed in connection with this method—such as filtering the escaping air by means of charcoal or some chemical—are rarely used now. The charcoal method is certainly ineffective as soon as the charcoal becomes wet; also, all these methods must create great obstacles to the free passage of air, besides being costly and troublesome to maintain in anything like proper working order.

The next method of sewer ventilation which I shall refer to is dependent upon the abolition of the intercepting trap. This is a method which has found much favor of late, especially among engineers, whereas most medical officers of health I believe have been opposed to it. At first sight it appears an excellent solution of the difficulty, as, by having tall ventilating-shafts on each house drainage system, you have the sewers connected to an immense number of ventilating shafts, each of small area, but combined giving a splendidly ample area of openings for the extraction of foul and the admission of fresh air. The local authorities have nothing to pay in the shape of way-leaves, no trouble to find suitable positions, no expense of upkeep, no complaints of smells from surface-level ventilators. Some of the soil-pipe ventilators no doubt act as inlets, and others as outlets, and most of them act sometimes in one direction and sometimes in the other. The total result is very satisfactory, however, from the point of view which looks only at the constitution of the sewer air. Probably under such a system the air in the sewers would never smell very foul. But if Horrocks' experiments prove anything, they prove the value of the intercepting trap in preventing the air of sewers from contaminating the house drains, and in cutting off the drains of one house from its neighbor so that the presence of typhoid excreta in the drains of one house will not mean the possible and even the probable passage of the typhoid bacillus into the drain air of the adjoining and other property. In such a case a comparatively minute leak in the drainage system close to the house might be a very great danger. It is precisely the joints close to the house which, even if sound at first, are apt to become defective owing to a slight settlement of the foundations. I think there is very good reason for the almost universal desire among tenants to know that their drains are effectually cut off from all direct aerial connection with those of their neighbors and from the sewer. I am therefore of opinion that this method, although very tempting on account of its simplicity and cheapness, is dangerous, and cannot be recommended.

In some places where they have not gone so far as to abolish intercepting traps, ventilating-pipes of light iron, such as is often employed for soil-pipes, and of 4-in. or 6-in. diameter are employed, connected directly to the sewers, but running up house walls. These, of course, if carried well above the roof, are safe so long as all the joints are air-tight, both those above as well as those underground. But any settling of the house-walls leads to a defective joint at the most important place, namely, the connection of the iron-pipe to the earthenware-drain. Any leak in this situation allows sewer gas to enter the house. The fear of this creates great difficulty now-a-days in getting permission to fix these pipes to a house-side; personally I should have much objection to living in a house to which such a sewer ventilator was attached. There is less objection to affixing such pipes to the walls of buildings such as stables or warehouses. I have seen them attached to telephone or telegraph posts, but I should imagine the effect of strong winds would rapidly cause a defective joint at the foot of the pipe.

Attempts have been made in some places to secure effective ventilation by connecting large diameter pipes to mill chimneys or furnaces to obtain a strong extracting effect. Unfortunately it is found that the suction may be so strong as to unseal the intercepting traps in the immediate neighborhood of the ventilator, whilst the effect is felt only very slightly at a little distance. Shone's system of mechanical ventilation carries the principle of mechanical extraction very much further, and is undoubtedly very ingenious, with its scientifically arranged size of air-inlet proportioned to the distance from the source of extractive power. It seems to me, however, that the cost both of installation and of working must necessarily be very high, whilst any accidental or unauthorized inlets would be liable to upset the working of the whole system.

Certain forms of ventilating lamps in the shape of small iron independent columns give a certain extracting effect and are at the same time supposed to burn up and destroy organic matter and effectually kill any germs present. I have no doubt that this does occur to some extent, but we have as yet no satisfactory evidence that this disinfection of sewer-air is so complete as to render these lamps quite safe to be employed in such close proximity to the windows of dwelling houses as would sometimes be necessary. Besides, with a sufficient number of these lamps to give efficient ventilation, the cost of the gas consumed would amount in the course of the year to a very considerable item.

To my mind, the only method of sewer ventilation which can be safely recommended at present is by means of independent ventilating columns of iron or steel, tall enough to carry all dangerous gases well above all dwelling houses, placed as near the sewers as possible, and with the smallest possible number of bends. Where lighter but still gastight shafts can be erected against buildings, not used for constant occupation by human beings, these might also be used. It is no use labelling one as inlet and another as outlet, because each column will act sometimes in one direction and sometimes in the other. I believe, however, that natural agencies would keep up air-currents; such as the wind blowing over the top of the shafts and the effect of the sun's heat, which often, I think, acts very strongly in the case of an iron shaft. Such a system gives us at any rate an outlet for sewer gases, and prevents the forcing of house-traps. I do not believe that it would give a pure air in our sewers under all conditions, such as a state of little wind and a close approximation of temperature outside and inside the sewers, but under ordinary circumstances it will keep the air sufficiently safe to allow of the workmen entering the sewers when necessary. Personally this, I think, is all we can expect or require, and would be very much better than the state of things now existing in many places, in which a policy has imperceptibly grown up of closing all the surface ventilators as complaints occur, until at last the sewers are left entirely unventilated, giving rise to occasional forcing of traps and the consequent dangers.

If I may refer for a moment to a subject not exactly within the scope of my paper I would say that Horrocks' experiments have confirmed a conclusion which has been forcing itself on my mind for several years past, and that is that the low ventilator, as usually fixed, is a danger and will have to be abandoned. Sometimes these are fixed in the front garden walls of houses; the flushing of a water-closet in a house where there is a case of typhoid may easily convey the germ to a casual passer-by. Similarly with sewer-gas escaping through the forcing of a trap. Another form of danger arises from the increas-

ing frequency of fixing an intercepting chamber instead of merely a trap. Builders, unless they are strictly looked after, often neglect to cement the inside of these chambers. The result is practically to have a leaky drain, as the ordinary brick-walls of these manholes are pervious to drain or sewer-gas. Similarly the manhole cover is often left unsealed by Russian tallow. What is the use of being so careful to have air-tight cement joints to the drain, buried many feet under ground, and yet to leave the manhole defective? Another item in this connection requires careful attention. I refer to the stopper of the rodding arm of the disconnecting trap in the chamber. All who have had much experience will agree that it is the exception rather than the rule for a builder's workman to fasten in the stopper with Russian tallow. Consequently, when examining such a manhole one finds the stopper loose and practically useless, or out altogether, thus giving free access to sewer-air. Or it may be that a mysterious block causes an investigation and the stopper is found to be the delinquent, having been carried through the trap and blocking the drain on the sewer side of the trap. I think some form of stopper arranged to be securely fastened should be compulsory, and I hope that some inventive genius will soon produce an intercepting trap with a patent stopper, easily fixed, perfectly air-tight, and immovable under ordinary circumstances, yet easily removed from the manhole top in case of a block, and not substantially more expensive than the ordinary type.

PLUMBING RULES NEEDED TO PROVIDE ADEQUATE SANITARY TOILET FACILITIES AT AMUSEMENT PLACES IN MANY PARTS OF THE COUNTRY.

That rules and regulations providing for the installation of toilet facilities at public amusement places and resorts are needed in some parts of the country, is evidenced by several special reports recently received by "Domestic Engineering" in answer to a request for information on this point, which we sent to plumbing inspectors and health officers in the larger cities. Our question was worded as follows:

"Have you any ordinance or state law which provides adequate supervision of public-amusement places and resorts, and which compels their proprietors to install sanitary toilet facilities proportionate to maximum attendance?"

Among the answers received were the following:

C. H. Wheeler, Health Officer, Portland, Ore.: "None other than those referring to lodging-houses, factories and work-shops."

Eugene W. Scheffer, Secretary of the Department of Health, New York City: "The Department of Health, the Bureau of Buildings and the License Bureau all have jurisdiction with greater or less degree over premises of this character. There is no law which authorizes or compels any of the above mentioned departments to require the installation of sanitary toilet facilities proportionate to the maximum attendance. The Department of Health, as a matter of routine, abates nuisances only."

W. C. Folsom, Chief Sanitary Inspector, Cincinnati, O.: "There are city laws regulating the toilets in stores, factories workships, hotels, lodging houses, and tenement houses as follows: 'All stores, factories and workshops shall be provided with proper facilities for the use of all employes. There shall be at least one (1) water-closet and one (1) wash sink in every store, factory, or workshop were any help whatever is employed, and shall be increased in proportion so that there will be at least one (1) for every twenty (20) people employed. All stores occupying more than five thousand, (5,000) square feet of floor area and used for general retail business shall be provided with toilet facilities for the use of the public. Such toilet facilities shall consist of at least one (1) wash sink and one (1) water-closet.'.....'In all hotels and lodging houses proper toilet facilities shall be provided as follows: Where the hotel or lodging house is occupied by one or both sexes, there shall be one (1) separate compartment for each sex occupying the same. Each compartment shall be equipped with a washstand or sink, a water-closet and a bath, and there shall be at least one (1) water-closet, one (1) washstand or sink and one (1) bath for every ten (10) rooms in such building. The baths may consist of tub baths or shower baths, but there shall be at least one (1) tub bath and one (1) shower bath in every such house. Such bath shall be provided with hot and cold water. ..... In every building, hereafter erected, for or converted to tenement house purposes, there shall be (except as hereinafter provided) a separate water-closet for each apartment, placed in separate compartment within the apartment not less than two (2) feet and six (6) inches wide in the clear. Said apartment shall be inclosed with plastered partitions extending from the floor to the ceiling. But nothing in this section shall prevent a water-closet from being placed in a bathroom, or in a compartment adjoining a bathroom, provided it is connected with the same by a window similar to the one heretofore specified. When, however, apartments consist of one or two rooms each, there may be one water-closet for each two apartments, provided the aggregate number of rooms in the two apartments does not exceed three (3), and provided further, that the water-closet is between or adjacent to the apartment and is not separated from either of them by a public hallway, and is accessible to each of them without passing through a room of another apartment. No water-closet shall be maintained in the cellar of any tenement house without a special permit in writing from the Commissioner of Buildings and the compartment containing same must be properly lighted and ventilated in a manner approved by the Commissioner of Buildings. Every water-closet compartment in every tenement house, lodging house or hotel, shall be provided with proper means of lighting the same at night.'

"I believe that the general powers we have can enforce adequate toilet facilities at public amusement places and resorts. We have experienced no trouble with them in the past."

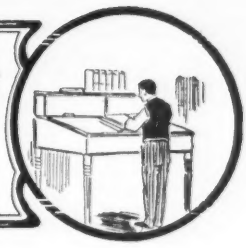
John B. Anderson, M. D., Secretary of the Health Department and Health Officer, Spokane, Wash:

"We have no state law or other ordinance regulating the adequate supervision of amusement places and resorts, and yet we manage to handle the sanitary arrangements connected therewith quite satisfactorily under the general health regulations."

Colorado Springs, Colo.—The D. I. Flatt Plumbing & Heating Co., 10 Post Office Pl., which purchased the plumbing and heating business of E. R. Joyce in this city last winter, is composed of David I. Flatt, Colorado Springs; John A. Nichols and W. L. Warren, both formerly of Joplin, Mo. Mr. Joyce had been in business here for 20 years, and Mr. Flatt was in his employ for 16 years previous to his company's purchase of the business. The new company will be glad to receive catalogs from jobbers and manufacturers of plumbing and heating goods.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



THE NECESSITY OF THE ANNUAL INVENTORY.*

By August P. Froelich, of Froelich Bros., Philadelphia, Pa.

There are some men who have not recognized the fact that an inventory is an indispensable essential in connection with the conduct of business. In many cases, it is perhaps due to the fact that little or no thought has been given the question, that such an opinion is held. Surely, in such cases the reasons which make necessary a periodic account of stock and settlement of the books, have never been seriously considered.

There are some plumbers who say to themselves, if they think of the matter at all: "What is the use of taking stock? I know by looking over my goods how much I have on hand."

This reveals a mistaken idea about stock-taking. The inventory does not only result in a very close knowledge of how much money, or its equivalent, one has invested in business or what goods he has on hand—it shows him, after entering the inventory in his books, to a penny, whether or not the business has profited him during the year.

No man can estimate how many dollars he has gained, but only by means of an inventory and settlement of books of account on a fixed date, can plumbers and all other business men find out just where they stand; how much money they are worth in plant; how much in stock; how much in good and bad debts, and last, but not least, whether their returns are balancing their expenditures.

Stock-taking should be looked upon as a thorough and exhaustive examination of the state of one's affairs. It is as a day of reckoning when we get right down to "brass tacks" and find out whether we are making or losing; whether we are going ahead or falling back; whether or not we are careless in the conduct of our business. Surely, for such a purpose, annual stock-taking is a thing worth doing and, of course, a thing worth doing well.

An excellent opportunity and time for a good, thorough housecleaning is afforded by the taking of an inventory. Odd lots of goods which you did not know you had, will possibly show up, and you will know exactly what overstock of certain goods or sizes of goods you have on hand. When figuring the value of your bad stock get your prices down. Don't try to fool yourself. Price it at what you really believe you could sell it for.

Then, when putting your house in order, you can set aside unsalable goods and use them or get rid of them for whatever price you can get. If necessary, sell the goods as "junk" rather than have your place cumbered up by a lot of worthless stuff.

It never did anybody any good to keep a lot of junk around, and plumbing shops and warehouses will make more money for their owners if they are cleared of all material which is not salable or in good shape for utilizing in a profitable way.

When the annual inventory is taken, the totals should be divided into departments to correspond with the various accounts, such as merchandise, vehicle, tools, etc., which are kept, or should be kept, in the ledger.

The item of depreciation of stock, fixtures and plant should be thoroughly considered and fully allowed for.

Tools should be taken at the lowest possible figure. You know that if you wished to sell your tools they would bring but a fraction of what you paid for them. A good custom is to deduct or charge off a certain percentage of their value each year so as to constantly carry them only as an asset at nearly their actual value. Then, when you come to putting down the value of your horses and wagons, be sure to get the value a little lower than you think you would get for them if you were to sell them. No matter how good they are, you will find that the price which you can actually get for them, when you sell them, will not be much above your low estimate of their value for inventory purposes.

One of America's foremost business men, no less than John D. Rockefeller, recently said:—

"When a man's affairs are not going well, he hates to study the books and face the truth. From the first the men who managed the Standard Oil Co. kept their books intelligently as well as correctly. We knew how much we made and where we gained or lost. At least, we tried not to deceive ourselves.

"My ideas of business are, no doubt, old-fashioned, but the fundamental principles do not change from generation to generation, and sometimes I think that our quick-witted American business men, whose spirit and energy are so splendid, do not always sufficiently study the real underlying foundations of business management.

"I have spoken of the necessity of being frank and honest with one's self about one's own affairs; many people assume that they can get away from the truth by avoiding thinking about it, but the natural law is inevitable, and the sooner it is recognized the better."

Again, from a fire-insurance standpoint, an inventory is absolutely essential, as is also the exhibition of figures showing purchases and sales. The adjusters for fire-insurance companies always call for the inventory to support a claim for loss by fire or water.

Any one who has a fire and who wishes to make adjustment with the fire-insurance companies, is absolutely at sea and liable to suffer serious loss if he cannot present in a businesslike form some good basis for figures affording ample proof for the amount of loss sustained.

If he can show his annual inventory, together with his record of sales and purchases, he is on pretty safe ground and all fire-insurance men will quickly recognize a claim supported by this kind of evidence. There will thus be avoided a loss which might otherwise have been unnecessarily sustained.

It is customary to keep a copy of the inventory as well as all books of record in fire-proof quarters. In fact, it is not at all a bad thing to have an extra copy of the inventory in a separate place, because no one knows when it will be destroyed and another one needed.

*Reproduced by courtesy of "The Plumbing and Heating Magazine."

Therefore, it is clear that from every standpoint an annual inventory is an essential which cannot be avoided—in fact, an essential which it would be very undesirable to attempt to avoid.

Conditions are always changing, and modern, progressive plumbers are appreciating the situation keenly and keep well abreast of the times. Those not now taking an annual inventory can well afford to give the subject their serious consideration.

Stock-taking should tell if you are moving with the times. Those who are not, should know of it, so that they may mend their ways, and avoid any untimely conclusion under unpleasant conditions.

IT'S UP TO THE MASTER PLUMBERS.

Editor "Domestic Engineering":—Something has been said in your paper about some of the jobbers selling to plumbers who are not responsible, and taking owners' garantees, or depending on liens for their pay. One of your correspondents has suggested a remedy for this. He thinks that goods delivered only to the shop and not on the job, would accomplish what is wanted. Now, you boss plumbers, don't stand in your own light and let any rules of this sort be slipped over on you. The jobbers would welcome a rule of this sort, as they could save considerable money on their hauling bills, and you, the master plumber, would as usual have to pay the freight. Your hauling bill will increase a whole lot, and you still have not stopped the jobbers from selling to the unreliable fellow, you haven't stopped them from taking a responsible owner's garantee. What is there to prevent an irresponsible plumber from getting a responsible owner's garantee to pay for goods, and what is there to stop the jobber from selling in this way even if goods are delivered only to the shop? The jobbers can no doubt show you where these goods have been paid for and paid for promptly, but by whom? the jobber's books show by the plumber, but of course he and you know differently. Some one has also suggested placing a credit limit, but the jobbers can also beat this system if they care to. There is only one way to keep the jobbers from selling to unreliable plumbers or taking owner's garantees, which practically amounts to selling to the owner (only that it is done indirectly) and that is, when you are certain that a thing of this kind has been done, "cut out" that jobber, quit trading with him. You will find some jobbers who are willing to do the right thing by you, and they are the ones to patronize. Do not play into the jobbers' hands. Make your own set rules, tell the jobbers what you want (you are the men that are buying and paying for the goods and should have something to say), and see that you get what you want, the way you want it and when you want it. There are about 15 to 20 boss plumbers in Minneapolis who can control the whole situation. Now, you Mr. Master Plumber, you are the one who holds the winning card—play it.

"The Office Boy."

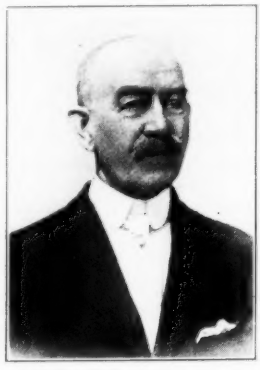
W. A. SHORB ON THE RATING OF BOILERS.

W. A. Shorb, president of the Leader Iron Works, Decatur, Ill., writing recently to "Domestic Engineering," said concerning the rating question: "Regarding the present ratings of the steam water-heaters, I would say that they should be considered about on the basis of house-heating boilers. In other words, it is necessary to just about double the net radiation to be served from the ratings given for a suitable sized heater for the heating job."

J. W. FARRELL, PLUMBING INSPECTOR, SALT LAKE CITY.

Our illustration presents to our readers the well-known features of Salt Lake City's popular plumbing inspector, J. W. Farrell. Mr. Farrell is one of those men who followed the advice of the immortal Greeley—"Go West, young man, and grow up with the country." He first arrived on this planet at the depot of Newark, N. J., and went to California while quite young, where mosquitoes were said to be non-existent. Friend Farrell got quite well acquainted with the western resources, for he was on the job in Storey County, Nevada, on the Big Bonanza mines when they were first struck, also in the money-finding days of Virginia City Mr. Farrell had the gold-rushing fever.

Later on Salt Lake City appealed to him and there he engaged in the plumbing business for over 20 years. He



J. W. Farrell, Plumbing Inspector, Salt Lake City.

was appointed plumbing inspector for four years in 1908. This term of inspectorship ends on January 1, 1912, and the efficient service he has given the city will, no doubt, bring about his re-election at that time. He has many friends throughout the territory and his word is regarded to be as good as his bond. Master plumbers of Salt Lake City often state that Farrell is always on the job to see that first-class work is installed throughout his jurisdiction.

Salt Lake City's jealousy of the reputation of Indiana for literature has produced a number of poets with and without license; one of the first-named—"Noble May"—recently found J. W. Farrell a fitting subject for his rhyming art with the following pleasing result:

A Toast to the "Reliable" Man.

Here's to the steadfast, reliable man,
The man with the tongue that's true,
Who won't promise to do any more than he can,
But who'll do what he says he'll do.

He may not be clever, he's often quite blunt,
Without even polish or air;
But, though it's not in him to "put up a front,"
When you need him he's always there.

So here's to the man on whom one can rely,
And here's to his lasting success;
May his species continue to multiply
And his shadow never grow less.

Mr. Farrell is taking a prominent part in assisting the master plumbers of Salt Lake City to perfect the details of the many arrangements for the comfort of visitors to the great Salt Lake City Convention. We expect to be there and among those whom we desire to greet first will be J. W. Farrell, the newly re-elected plumbing inspector of Salt Lake City.

Newark, N. J.—The Howard Plumbing Supply Co., Howard and Mercer streets, reports business good having recently secured contracts for furnishing plumbing material for 25 two-family houses and several other new structures.

A Study of the Effect of Sulphur in Illuminating Gas on the Air in Rooms

Arthur D. Little, chemical expert and engineer, Boston, Mass., has recently completed an exhaustive series of experiments to determine the effect of sulphur in illuminating gas upon the air in rooms. In an ordinary dwelling house a single room was set apart for the experiments and apparatus was provided to determine the amount of gas burned within the room, the amount of sulphur originally contained in the gas, the amount of sulphur present in the air of the room, its rate of disappearance and its effect upon objects and human beings.

The occasion of these tests was primarily to determine whether a reasonable amount of sulphur in excess of 20 grains per 100 cu. ft., which is the present Massachusetts limit, would prove in any way objectionable. It was shown that under the existing limitations a special hardship was imposed upon the gas producer because of the increasing difficulty of securing coal so low in sulphur as to make possible the manufacture of gas containing not over 20 grains of sulphur to 100 cu. ft. Mr. Little has traced out and presented in a very comprehensive report the conditions which originally prompted stringent sulphur limitations. It is his opinion that for the most part these were without justification, and that the liability of danger from sulphur gases has been greatly misunderstood and exaggerated. That the removal of sulphur restrictions from gas or an increase in the amount permissible will cause no inconvenience, is attested to by the fact that the gas authorities and examiners of London unanimously report that the removal of restrictions in that city, to such an extent that oxide purification alone is now used, has occasioned no complaints and has proved to be so thoroughly satisfactory that it has since been greatly extended throughout England. It is also a noteworthy fact that the inhabitants of other districts in this country free from sulphur regulations (and but a surprisingly small percentage of the country has any such regulations) do not appear to make any complaints that would indicate inconvenience from sulphur in gas.

The report shows that sulphur gases formed on the combustion of illuminating gas are removed from the air of rooms in three ways: by the changing air in the ordinary course of ventilation, by condensation along with water vapors on the cold walls and windows, and through absorption by the alkaline constituents of the walls and ceilings. It was very clearly demonstrated that other conditions being the same it is only within narrow limits that an increase in the amount of sulphur in the gas or of the rate at which gas is burned causes a relative increase in the sulphur to be found in the atmosphere of the room. When the sulphur present in this atmosphere increases markedly, the more rapid is the reaction between the plaster of the walls and ceilings and the sulphur gases. That is to say, the plaster takes up the sulphur gases with greater rapidity. Calculation, however, shows that the plaster of an ordinary ceiling would serve to absorb sulphur gases from 20 grains gas burning 25 cu. ft. per day during the probable existence of a house. It is therefore evident that in the ordinary dwelling the plaster serves automatically to prevent a material increase of the sulphur in the air, even though there be a great increase in that contained in the gas. The relation of this fact to the hygienic conditions must be manifest. In fact it was shown that the outside atmosphere contained at times one-third to one-fourth as much sulphur as may be found in an ordinary gas-lighted room. In a well ventilated room with one or more occupants, it was shown that the lighting of the gas would cause such a small rise in the sulphur present as to in no way become manifest to the senses. In fact, it was shown that the sulphur would have to be increased to many times that of the ordinary room before the senses would be able to detect it.

A careful search through many of the larger works on physiology and physiological chemistry failed to discover any information on the physiological effects of sulphur dioxide. In many of the lists that included carbon dioxide, carbon monoxide, methane and chlorine among the poisonous gases, no mention was made of sulphur dioxide. The sulphur gas commonly mentioned as being poisonous was hydrogen sulphide. The most definite statement found regarding sulphur dioxide simply stated that "sulphur dioxide in large amounts is toxic."

When the concentration of sulphurous acid in the atmosphere rises to about four parts per million in the air, it is claimed that the gas can be perceived, not by the smell, but, as some describe it, by the taste. At five parts per million gas can be distinctly smelled. In concentration above this it produces more or less irritation of the nose and throat, and might therefore have a deleterious effect on the membranes of the air passages.

In none of the experiments conducted by Mr. Little did the sulphur dioxide exceed 0.8 per cent per million even under the most restricted ventilation, and when gas containing 36 grains of sulphur was used. It becomes evident therefore that in any room where people live, on account of the carbon dioxide content, the sulphur dioxide from burning gas would never reach a point where it would be harmful.

Even under the most restricted conditions of ventilation it was shown that the burning of gas purified by oxide alone would not give rise to any odors of sulphur gases, and it was evident that any depressing effect was due to the large amount of carbonic acid liberated by the gas. In fact when a great excess of sulphur in the form of dioxide was artificially introduced into the room in addition to that liberated by the burning gas, no odor of sulphur gases was noticeable. It was determined as regards the vitiation of air by carbonic acid that one man had about the same effect as gas burning at the rate of 5 cu. ft. per hour. Even when the ventilation in a room was restricted as much as possible the air changed 1.8 times per hour by diffusion through the plaster and walls. When the ventilation was rendered favorable for regular living conditions, the rate of change of air was several times greater than the figure just given. The influence of such rapid changes of air in a room in augmenting the absorptive effect of the plaster in preventing a high sulphur content is apparent.

The study of humidity conditions made it evident that but little condensation of moisture would take place on the surfaces of articles in the room, and hence that there would be little or no formation of sulphurous or sulphuric acid, or of injury which might result from the presence of such acids. Metals exposed within the room and also out of doors showed but little difference in the tarnishing effect. No appreciable fading occurred in the case of a large number of dyed samples exposed to the effects of burning gas within the experimental room. The very small amount of sulphur actually discharged

into the room by the burning of gas was shown by the fact that the lighting of an ordinary sulphur match would liberate as much sulphur into the room as ordinarily would be liberated by 20 grains burning for 22 minutes.

All of the experiments pointed very clearly to the fact that no injurious effects would result from the burning of gas containing an amount of sulphur materially in excess of 20 grains, and it was finally shown that a raising of the sulphur limitations on gas, while productive of no ill effects, would make available for the gas manufacturer a wider variety of coal, and as a consequence, by making unnecessary the wasteful mining methods followed in taking out low sulphur coals, would be an important practical step toward the conservation of one of the greatest of our natural resources.

FLIES.*

Vest-Pocket Essay by George Fitch.

A great many years ago this was a safe and happy country. There was nothing for the pioneer to fear but Indians, wolves, bears, rattlesnakes and malaria. Alas, those happy, care-free times are past. We must now sit, ever vigilant and sleepless, guarding our loved ones, for who knows at what minute a fly may burst its way into our happy home and glut its appetite with fair young lives?

A fly was once a small buzzer with a fondness for falling into the buttermilk and for sunning himself on the baby's nose. But since science has turned its microscope on him he has become a huge menace with fierce, hairy legs. He is a microbe omnibus and carries millions of assorted germs from place to place without charging fare. In one short forenoon a moderately industrious and accommodating fly can load up with 11,000,000 tuberculosis germs, 27,000,000 hay fever germs, 15,000,000 bronchitis microbes and a few million assorted rheumatism, malaria, locomotor ataxia and lazy bacilli. Having gotten this cargo he proceeds with all speed to the nearest human being, on whom he alights. He buzzes "all off," and rubs his legs to help the job along. The grim tiger stalking his victim is not considered by doctors to be so terrible as the common biplane housefly who sits on the skating rink of a prominent citizen and rubs quarts and quarts of deadly microbes off on the unprotected head of his victim.

The fly has been muckraked so much that he is now generally regarded as an undesirable and leads a hard and exciting life. He is pursued with poison, folded newspapers, traps, wire swatters, editorials and resolutions. He that swatteth a fly is now held to be a good citizen, no matter how careless he is about voting, and the spider who was once held in great dislike because of his heartless ways is now so beloved because of his appetite for flies that no home is happy without one. The "Swat the Fly" campaign last summer decreased the total visible supply of flies from 23,000,000,000,000 to 22,999,999,000,000. It has also reduced the visible supply of bric-a-brac by 7,876,564 pieces. It would be discouraging to think that each one of the remaining flies would be capable of producing 7,000,000,000 descendants next summer—if it were not for the fact that nature in her gentle way disposed of most of the survivors with the first big frost. This teaches us, beloved, to leave the fly-swatting job to nature and to take up once more the neglected talk of swatting bad legislation.

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Sec. 2. The use of the latrine system in water-closets and toilets in such buildings shall be allowed only at the discretion of the Commissioner of Health. Such systems shall be automatically flushed at least once in five (5) minutes, and shall be enameled or lined with a non-deteriorating surface impervious to water, and equipped with seats fitting the bodies of the persons using them.

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Sec. 5. The Commissioner of Health is authorized and empowered to order such changes in the location or construction of toilets, toilet-rooms and water-closets in any such buildings as in his opinion may best serve the interests of sanitation, and any person failing to comply with an order of the Health Commissioner given under this section shall be subject to the penalty prescribed in section 6 of this ordinance.

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Passed Nov. 6, 1911.

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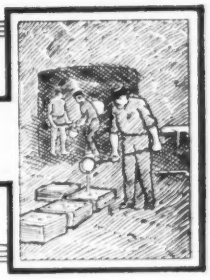
Approved Nov. 9, 1911.

Emil Seidel, Mayor.

THE METAL MARKET



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United States (domestic)	372,227
Total	1,211,411

The value of the 372,227 short tons of lead produced in the United States in 1910 from domestic ores, based on the average New York price, was $32,755,976. The 354,188 short tons produced in 1909 were valued at $30,460,168.

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into the room by the burning of gas was shown by the fact that the lighting of an ordinary sulphur match would liberate as much sulphur into the room as ordinarily would be liberated by 20 grains burning for 22 minutes.

All of the experiments pointed very clearly to the fact that no injurious effects would result from the burning of gas containing an amount of sulphur materially in excess of 20 grains, and it was finally shown that a raising of the sulphur limitations on gas, while productive of no ill effects, would make available for the gas manufacturer a wider variety of coal, and as a consequence, by making unnecessary the wasteful mining methods followed in taking out low sulphur coals, would be an important practical step toward the conservation of one of the greatest of our natural resources.

FLIES.*

Vest-Pocket Essay by George Fitch.

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PERSONAL MENTION.

James C. Clow, secretary of James B. Clow & Sons, Chicago, left this week on a trip to Honolulu, where he expects to stay two or three months. He is accompanied by his wife.

Jno. A. Peters, manager of the Minneapolis office of the John Douglas Co., Cincinnati, O., was in Chicago this week and called on some of his friends in the trade.

George Barron, a well-known plumbing supply salesman, has accepted a position with the Blake Specialty Co., of Rock Island, Ill., traveling in Ohio and Indiana.

J. B. Kalvelage, jr., of the Hoffmann & Billings Mfg. Co., Milwaukee, Wis., who is at the Columbia Hospital in that city suffering from typhoid fever, is now on the road to recovery, and it is expected that he will soon be able to leave the hospital. Our Milwaukee correspondent made a mistake last week in reporting that it was his father, J. B. Kalvelage, the well-known secretary and treasurer of that company who was ill.

NOW LOCATED IN WHOLESALE SECTION OF SAN FRANCISCO.

The American Faucet Co. and the Standard Brass Casting Co., of San Francisco, are now established in new quarters at 731-733 Folsom St., in the wholesale and manufacturing section of that city.

WILL MAKE HOUSE-HEATING BOILERS

The Victor Combination Boiler Co., Oakland, Cal., has been incorporated with a capital stock of $200,000, to manufacture house-heating boilers. The incorporators are Joseph Antonuccio, J. J. Antonuccio and S. Antonuccio.

INCORPORATION OF MARTEL HEATER MFG. CO., JERSEY CITY, N. J.

C. E. Martels, H. W. Martels and John B. Turner, all of Jersey City, N. J., have recently formed a corporation to be known as the Martel Heater Mfg. Co., to make fuel, gas and water heaters and appliances. The capital stock is announced as $250,000.

CRAWFORD & CO. LEASE SEVEN-STORY BUILDING.

Crawford & Co., 838 S. Canal St., Chicago, manufacturers of pipe-hangers, extension-bars, etc., have leased a seven-story building at 846-848 S. Canal St., into which they will move their factory and office on February 1, 1912.

THE CLOW TRAVELOGUE AND MUSICALE.

James B. Clow & Sons, Chicago, held a Thanksgiing celebration Tuesday evening, November 28th, at the Masonic Temple. The program said it was a "Travelogue and Musicale by Clow Amateurs." There were a number of intersting features, the chief being a lecture by James B. Clow on his trip abroad, illustrated by many photographs taken by him at Algiers, Biskra, Naples, Rome and Florence. The Clow orchestra excelled itself in musical renditions, and a number of members of the staff contributed vocal selections.

AMERICAN BLOWER CO. TO HAVE CANADIAN PLANT.

The American Blower Co., Detroit, Mich., one of the largest manufacturers of ventilating fans and special machinery, is to have a branch factory in Windsor, Ont. A factory-site of about four acres has been purchased on the Essex Terminal Railway, between Mercer and McDougall streets. A steel and concrete building 50 x 200 will be erected at once, and it is planned to follow this with three other buildings later. It is intended to employ a force of several hundred men when the plant is complete. This Canadian business will be carried on under a Canadian incorporation, to be known as the Canadian Sirocco Co.

STANDARD SANITARY MFG. CO. ISSUES ENTIRE STOCK OF ITS AUTHORIZED CAPITAL.

The Standard Sanitary Manufacturing Co., which has its central offices in the Bessemer building, Pittsburgh, Pa., recently decided to issue the stock still held in its treasury, thereby issuing the full amount of its authorized capital. This amount was $341,000 of the preferred stock, which is a seven per cent non-cumulative issue. Accordingly about 30 days ago, the officers began to place this in a quiet way and now over $270,000 of the $341,000 has been placed with former stockholders and others at par and interest. Most of the remainder of the issue has been subscribed for. That this stock has been so well taken when business conditions are considered, as well as the reports that have been in the newspapers regarding the so-called "bath tub trust," illustrates the strong position of this company. The issuing of this treasury stock gives the Standard Sanitary Manufacturing Co. a full paid capital of $7,500,000, of which $2,500,000 is preferred and $5,000,000 common.

THE DECEMBER MEETING OF THE ILLINOIS CHAPTER OF THE A. S. H. & V. E.

The regular monthly meeting of the Illinois Chapter of the American Society of Heating and Ventilating Engineers will be held Monday evening, December 11th, in the banquet-room at Vogelsang's Restaurant, 177 E. Madison St., Chicago. The meeting will be preceded by a dinner which will be served at 6 o'clock. The topic for discussion is "Hot-Water Heating Auxiliary Devices," and it will be illustrated with lantern slides and introduced by a complete description of the different devices by Harry de Joannis, chairman of the meeting. The Chapter's 1911-1912 year-book has just been issued by Secretary W. L. Bronaugh, and it contains a list of programs and committees for the year, names of past and present officers of the Chapter, its constitution and by-laws, and last but not least a list of the members with their addresses and telephone numbers. This latter item is something out of the ordinary but exceedingly convenient for local reference use, and Mr. Bronaugh deserves credit for the innovation.

AMONG THE REPRESENTATIVES OF THE HUMPHREY CO.

The Humphrey Co., Kalamazoo, Mich., now has its Kansas City, Mo., representatives nicely housed in a beautiful location in Grand Avenue Temple, at 907 Grand Ave., one of the most prominent locations in the city. W. F.

Niles, formerly attached to the Chicago store, is manager of the Kansas City branch, and is assisted by C. V. Sayles, W. E. Pray, Carl Paul, Wm. Farrell and E. R. Niles. Mr. Niles' energetic efforts to serve the trade are meeting with much approval, as evidenced by the business he is turning in.

J. M. Cammack is covering Nebraska, northern Kansas and southern Iowa for the Humphrey Co., Kalamazoo, Mich. He has had long experience in the gas appliance business, gained in New York City, and is able to be of great assistance to the trade he is visiting in the Humphrey interests.

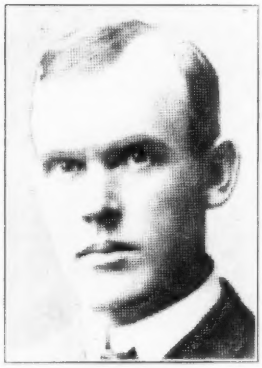
KNOTT MFG. CO. INCREASES CAPITAL STOCK AND WILL BUILD.

The stockholders of the Knott Mfg. Co., Ft. Wayne, Ind., held a special meeting Saturday, December 2nd, for the purpose of making provision for the rapid growth of the company's business. The common stock was increased from $15,000 to $25,000 and it was decided to issue $15,000 in preferred stock to obtain money for purchasing a building site and erecting a permanent plant. All of the $15,000 worth of original stock, which has been subscribed for and paid, was represented at the meeting, and practically the entire increase will be taken by the stockholders. When the plant was placed in operation last August the directors did not believe that it would be necessary to enlarge for a year at least, but the output is now in such demand that, although the factory has been taxed to its capacity, many large orders have been returned because of inability to fill them. The company, which manufactures plumbers' supplies, now occupies three floors of the building at the northwest corner of Barr and Columbia streets. Three or four available sites for the new plant are in view and the board of directors, which was empowered to make the purchase, will close a deal for the land within the next month. The officers of the company are: John T. Knott, president and treasurer; William D. Henderson, vice-president, and Onslow H. Orr, secretary, the two former with Charles W. Orr, D. Burns Douglass and Samuel Knott forming the board of directors.

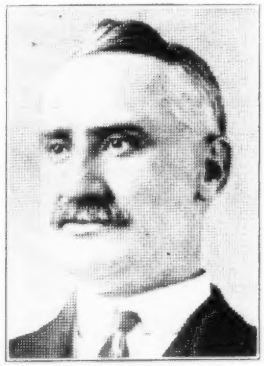
THE BLAKE SPECIALTY CO. OCCUPIES ITS NEW PLANT.

The Blake Specialty Co., Rock Island, Ill., has taken operative possession of its new $30,000 building on Mill street near 15th avenue, Rock Island. The company has made a lot of progress since its incorporation in March, 1909.

Its manufacturing enterprise is one of the most important of Rock Island's industries. At the time of its formation, the company was incorporated modestly, with a capital stock of $12,000, this capital being increased to $60,000 at the present time. The necessity of new quarters has been made manifest for some time, owing to the great extension of the company's business.



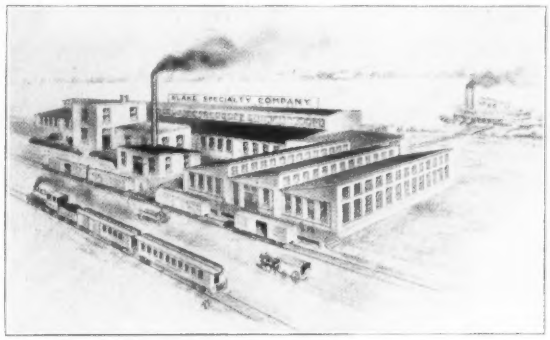
John D. Blake.



John T. Shields.

John D. Blake, the head of the company, was identified with the plumbing trade for years, and his assiduous study of the needs of the trade resulted in his invention of the Blake cleanout, which was the basic product of the company's manufacturing enterprise. There followed in quick succession the floor-drain, trap, test-plug, fittings, bends, and other plumbing accessories, which have by this time become familiar to the trade throughout the country.

The new plant comprises six buildings, with 16,600 sq. ft. of floor-space, and possessing convenient track facilities for the reception of material and the shipment of finished products. The buildings include a foundry, 80x100; cupola-room, 20x30; core-room, 20x30; mill-room, 30x45; machine-shop, 60x75, and heating and pumping-plant, 25x40.



The New Plant of the Blake Specialty Co., Rock Island, Ill.

All the machinery installed is of the most modern type procurable, and each machine is individually driven by motor. Special attention has been paid to the sanitary condition of the workmen, and individual lockers and shower-baths will be provided. At the present time 50 men are employed constantly, but the force will be increased by half that number in the near future.

J. J. Croft, for several years assistant superintendent of the Red Jacket Mfg. Co., of Davenport, Ia., is superintendent of the plant.

An efficient force of salesmen is maintained by the Blake Specialty Co., which has proved eminently successful in introducing the Blake porducts to many municipalities, and these specialties have also found favor in Canada and the Philippine Islands. The company has a branch house in New York City, and is contemplating establishing a distributive warehouse in New Orleans.

The president of the company is John T. Shields, who has been prominently connected with important commercial interests in Rock Island for years. Mr. Blake is vice-president of the company, and both of these gentlemen have youth and aggressiveness, qualities which have made possible the successful introduction of the Blake specialties to the trade.

Among the products which are attracting considerable attention at the present time is the Blake dirt-auger, for drilling holes for the piping from the house-connections to the mains in the streets. This eliminates considerable excavation, and the plumber is able to lay his piping by pushing it through from the cellar of the house.

The company is experiencing such success with its boiler-fittings that it is anticipated that a special galvanizing-plant will be needed, so that the galvanizing of the fittings can be done in the plant. Brass furnaces will also be installed for the brass-work used.

On the board of directors besides Mr. Blake and Mr. Shields are C. Buckley and E. Schillinger, well known business-men of Rock Island.

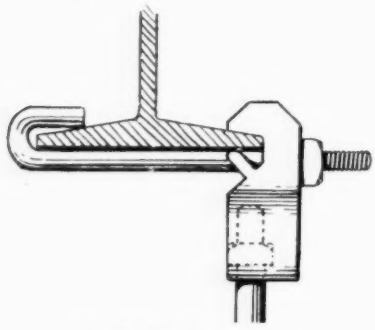
The new buildings do not cover the entire site acquired by the company, provision being made for the extension of the company's activities for some time to come.

WM. H. MASON DEAD.

Wm. H. Mason, for more than 50 years a resident of Brooklyn, N. Y., died at his home, 37 Van Buren St., on November 23d from debility resulting from old age. He was born on Nov. 6, 1825. Mr. Mason was well known as an expert on heating, and had long been connected with the Magee Furnace Co.

THE ECLIPSE BEAM-CLAMP.

The Morgan Spring Co., Worcester, Mass., manufacturers of pipe-hangers, has recently placed on the market a very simple and adjustable beam-clamp under the trade-name of the "Eclipse." This device has been on the market only three months but if the manufacturers had not foreseen the large demand there is for such a simple and effective clamp its stock would not have been sufficient to meet the volume of orders it has received. The



The Eclipse Beam-Clamp.

more notable features of this device are that its strength is constant and does not vary with the width of the beam to which it is attached; it is made entirely of steel, strong and simple in construction, easy to install, and fits all sizes of I-beam from 6-in., 15 lb., to 12 in., 35 lb. Master plumbers and steam-fitters who have not yet seen this beam-clamp can obtain full information from the manufacturers upon request mentioning "Domestic Engineering."

THE "ROARER" BENZOLINE SOLDERING LAMPS.

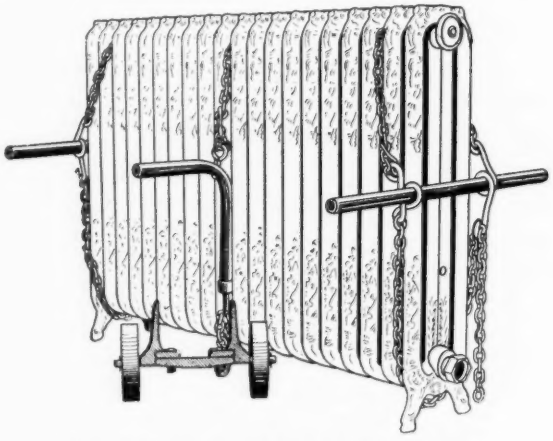
The Globe Gas Light Co., 25-27 Union St., Boston, Mass., has just placed on the market two small-size blow-torches, which have at once become favorites with every one who has had a chance to see and use them. These soldering lamps have been named the No. 6B "Roarer" and the No. 8B "Roarer." They are very small in size, well made, and give an intensely hot flame. The No. 6B is made for general use. It has no regulation attachment and the heating and lighting is done by a match. Its body is of steel, autogenously welded and galvanized, and the approximate weight of the entire lamp is only ½

6 B 8 B
The "Roarer" Benzoline Soldering Lamps.

lb., the capacity of its tank ⅛ pint, the length of the flame about 4½ in., and it will burn about 50 minutes with a single charge. The No. 8B "Roarer" is also a small and most handy lamp. It also has steel-body, autogenously welded and galvanized. Its flame is adjustable by regulating screw and it is well adapted for paint-removing, thawing frozen pipes, small soldering jobs, etc. The approximate weight of this lamp is 1 lb., the capacity of the tank 2/5 pint, the diameter of flame- tube at mouth 5/8 in., and the approximate length of the flame 5 in. This lamp will burn about 1 hour with a single charge, and its flame is so intensely hot that it will begin to melt a piece of copper wire 2-in. long and ¼-in. thick after one minute's exposure. Parties interested in these handy tools can obtain complete information from the Globe Gas Light Co. upon request mentioning "Domestic Engineering."

BUELL'S COMBINED RADIATOR-CARRIER AND TRUCK.

The accompanying illustration shows Buell's combined radiator-carrier and truck, a patented device for handling all kinds and all sizes of radiators. It is particularly well-adapted to the wants of the steam-fitter in taking radiators up and down narrow and crooked stairways so often encountered, as well as to repair work where radiators are to be moved and only one man, or possibly two, available. This carrier is made particularly strong to avoid any chance of accident; the chains used are ¼-in. and 3/16-in., both tested. The lower and heavier chains carry the load, the upper chains act as guides, keeping the radiator in an upright position and assisting when going up or down stairs. The handles are made of 1-in. wrought-iron pipe and can be quickly adjusted to any height radiator to suit a tall or short man. The handles can also be moved sideways when necessary in tight places, or to set a radiator close to wall. The truck is made of malleable iron and shaped to give the greatest possible strength for the weight. It can be quickly adjusted to any width radiator by means of two heavy square head set-screws. When truck is placed under radiator and a little past the center one man can move



Buell's Combined Radiator-Carrier and Truck.

the largest radiator any place on the same floor and set close to wall. Those interested in this handy and labor-saving device can obtain full particulars from its manufacturers, Buell Bros., Fulton, N. Y., upon request mentioning "Domestic Engineering."

ANNUAL EXPENSES OF ROCHESTER, N. Y., PUBLIC-COMFORT STATION.

The maintenance-cost of the public-comfort station at Rochester, N. Y., is, in round numbers, $2,600. This includes the salaries of two men and two women attendants, tissue paper towels, liquid soap, and other miscellaneous items.

And He Passed On.

There were plenty of empty seats in the car, but the smiling youth who wore his hat on the back part of his head stopped opposite the handsome young woman in the red hat, and said in his most engaging manner:

"Can I take this seat, miss?"

"I have no objection, sir," she said in a tone that froze the smile fast on his face, "but I think it's nailed down."

"When a man calls his wife's maid an angel it is time for the wife to make her fly."

NEWS FROM NEW ORLEANS, LA.

H. Barbe & Son have moved their plumbing and heating establishment into new and up-to-date quarters at 937 to 941 Bourbon St. Miss Melanie E. Barbe, H. Barbe's daughter, is now in charge of the office.

Brown & Whiting have secured the contract for heating and plumbing the Woodward Wight building. This structure covers almost an entire block and will be one of the most up-to-date and modern buildings in the country. It will be 5 stories in height.

Paul F. Mueller has just moved to his new two-story building at 8227 Oak St.

The New Orleans master plumbers recently enjoyed themselves in giving one of their famous layouts. This was the first of a series of banquets to be given to bring about a betterment of conditions. A wise move in the proper direction, and here's hoping they will be eminently successful.

Thos. W. Goreau continues very busy. He is always optimistic, and he is consequently always successful.

E. Elmore Jacob had the pleasure of something like 15 contracts the other day. These will keep him fairly busy for the balance of the season.

Emile Babst & Co. have formed a new corporation capitalized at $10,000 all paid up. The style of the new concern will be the E. M. Babst Co. The officers are: Chas. Babst, sr., president; Emile Babst, vice-president, and general manager; Peter Elizardi, secretary and treasurer.

Geo. E. Cowey, of the Columbus Brass Co., Columbus, O., is at present calling on the trade in New Orleans.

Grinaldi & Egloff keep fairly busy. They generally get their share to keep them going right along.

Charlton Bros. report business good, having been kept busy almost the entire year.

NEWS FROM WISCONSIN.

Merrill.—The Chamber of Commerce is trying to secure for this city a factory to manufacture bath-room accessories. A concern with $25,000 capital is considering the offer.

Eau Claire.—An up-to-date heating system has been installed in the plant of the Lange Canning Co. The job was done under the supervision of W. J. Brown.

Watertown.—Nowack & Kohls have installed a new heating system in their store building.

New Denmark.—A four-room modern public school building is being erected and the latest heating and ventilating systems and sanitary plumbing, are being installed.

Milwaukee.—The Pabst Brewing Co. is about to have a cooper-shop and wash-house, with latest plumbing and heating equipment, erected at an expenditure of $190,000.

Racine.—A number of buildings to be erected here in the course of a few months have been planned with the latest systems of plumbing, heating and ventilations. The B. P. O. E. club-house, which is to cost $40,000, heads the list, which includes: Stewart Webster, a $10,000 residence; E. W. Bartley, colonial residence; David G. Janes & Co., $70,000 bank and office building; Fred Schowaller, a $16,000 apartment-building; Mrs. Dumbrowski, a 2-story store and flat building. The Hartmann Trunk Co. is contemplating a new $100,000 factory structure to replace the burned structure.

THE NEW YORK STATE ASSOCIATION WANTS SANITARY LAWS ENFORCED.

Pres. John H. Moran, of the New York State Association of Master Plumbers, is doing good missionary work in calling attention to the non-enforcement of sanitary laws and provisions, as the following self-explanatory letter will indicate:

"Albany, N. Y., Nov. 23, 1911.

"Hon. E. J. Hanratta, Mayor,
"Watervliet, N. Y.

"Dear Sir:—I have been directed to advise you that at a recent meeting of the Executive Committee of the New York State Association of Master Plumbers, held at Glens Falls, N. Y., the following preamble and resolution was unanimously adopted, viz:

"'Whereas, It has been brought to our attention by the Legislative Committee of the New York State Association of Master Plumbers, that a recent new charter adopted for the government of the city of Watervliet, N. Y., among other things, provides for the appointment by its Mayor, of an Examining Board of Plumbers, whose duty it is to examine applicants, and license those who prove their competency to conduct the business of plumbing, with a view to safeguarding the public health from the evil effects of inferior workmanship, and

"'Whereas, We learn with much regret that as yet no action has been taken by the authorities of Watervliet, to enforce this provision of the law, a law which nearly every progressive city of the state long ago observed, and which neglect on the part of this growing municipality actually advertises it as being among the backward communities, in so far as sanitary precautions are concerned, therefore, be it

"'Resolved, That the state president be and he is hereby directed to advise the Mayor of Watervliet, N. Y., of this action on the part of this association and that he be authorized to use his best efforts in bringing about the observance of the law as regards this urgent and important matter; also, that every possible means be adopted to enlighten the public of that rapidly developing community of the necessity of a full and proper enforcement of this sanitary measure. Improper plumbing, it being well known to all enlightened people, a statement which will be borne out by the medical fraternity, almost to a man, is largely responsible for the spread of many of the filth, or zymotic, diseases and as this new law means a correction of disease-breeding plumbing conditions, every official and citizen is to an extent morally responsible in seeing to it, that the law be enforced to the letter, the protection of the public health being every one's duty.'

"Hoping that you will give this request early consideration, so a report may be made to our next state convention to be held in the city of Troy, N. Y., during March next, and in the meantime, that I may have the pleasure of hearing from you as to the prospects we may anticipate I beg to remain,

"Very truly yours,
"John H. Moran,
"President, New York State Association of Master Plumbers."

BEWARE OF THE FAKER!

Chas. Werner, of Werner Bros. Co., well-known plumbers of Jersey City, N. J., writes us as follows: "Please notify your subscribers to beware of a faker who is representing himself to be a plumber who has met with hard luck and who is looking for work to get his family back home. He will tell his victims he is an all-around mechanic and was in business himself and a member of the Master Plumbers' Association and refer you to the Red Book and tell you just where to find his name. He represented himself to me to be Geo. H. Gleason, of Watertown, N. Y., and told me of his son meeting with an accident in Baltimore, which resulted in his death. He said further that it took almost all he had to settle up matters and he was short about $2.70 fare to get his family home. I, thinking he was okay, as he told me he was a member of the association, and I looked up the book and found his address just as he told me, gave him $3, and he got $2 more from a friend of mine. If any master plumber can only catch him and it is not too far away from Jersey City, I would spend $10 to help put him where he belongs."

NEW ENGLAND NOTES.

Massachusetts.

Springfield.—Frank P. and Charles A. Donahue, proprietors of Donahue Bros.' plumbing establishment, at 42 Harrison Ave., have purchased the Athol building at 229 Main St. The building is five stories in height, built of brick and is valued at about $175,000.

Hull.—The Union church parish is to install a new heating system at a cost of about $2,000, if the amount can be raised. Bids will pr bably be asked soon.

Lowell.—Welch Bros. are doing the plumbing and steam-fitting work at the new dye house of the Bigelow Carpet Co.

Haydenville.—P. J. Murphy has moved his plumbing establishment to new quarters in the Market building, where he will be better able to care for his increasing business.

Connecticut.

Bridgeport.—Fred C. Booth, president of the F. & F. C. Booth Co., is being urged by the master plumbers of the city for appointment on the board of building commissioners to succeed William H. R. DuBois. A committee from the master plumbers' association, of which Mr. Booth is a leading member, has waited upon Mayor Wilson in his interests.

Hartford.—The finance committee of the board of aldermen has acted favorably on the request of the health board for an appropriation sufficient to pay for an assistant inspector of plumbing.

Hartford.—The appointment of an assistant to Inspector of Plumbing John H. Malloy is being considered. The new building this fall is very extensive and in order to care for the inspection work it is claimed that Mr. Malloy is obliged to have another to do much of the inside clerical work. The matter is being considered by the finance committee.

Waterbury.—M. F. O'Hara has the contract for the plumbing and heating for Louis Bruner's new house in Oakville.

Plainfield.—W. P. Babcock has the contract to instal a steam-heating system in the residence of A. C. Tillinghast on Main street.

Glonbrook.—Walter R. Johnson has opened a plumbing establishment in the store at "Miller's Corner."

New Hampshire.

Whitefield.—The Whitefield Plumbing & Heating Co. is installing a heater in Charles Emerson's new house in Dalton, and has a similar contract for the Ravine House in Randolph.

The Two O'clock Train.

It was a very small western town and the only train out of it that night left at 2 o'clock. The traveling man had impressed upon the night porter at the hotel the importance of calling him in time for this train. Promptly at 1:30 a prodigious knock aroused the sleeper.

"Say! Be yez the man what wants the 2 o'clock train?"

"Yes," was the sleepy reply from within.

"Well, yez can schlape an hour longer, for she's so much late."

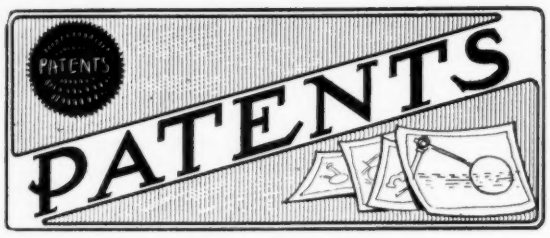
The heavy feet shuffled off down the hall and silence ensued. Another hour had passed when Pat again knocked.

"Say! Be yez the feller what said he wanted to ketch the 2 o'clock train?"

"Yes," and there was a sound of the man hastily springing from his bed.

"Well," drawled Pat, "yez can go back to bed again, for she's another hour late."

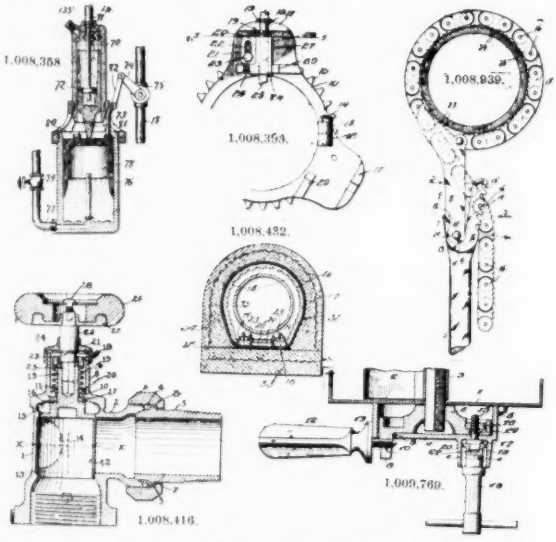
A forcible remark or two proceeded from the traveling man's room and were audible to his awakening neighbors, as was the departure of Pat; but soon all was quiet again and the few occupants of the hotel were left for some time to undisturbed repose. Just as the first faint streaks of dawn were tinging the sky Pat once more made his presence known and, in tones giving unmistakable evidence of recent and heavy slumber, remarked: "Say! If yez was the felly what wanted to ketch the 2 o'clock train yez can schlape till mornin', for, bedad, the blame thing's gone!"



Heating Department.

1,008,358. Apparatus for Heating Fluids. Edward C. Newcomb, North Scituate, Mass., assignor of three-fifths to Philip Van Volkenburgh, New York, N. Y. In an apparatus for heating fluid, the combination with a receptacle for the fluid to be heated, means for maintaining a supply of the fluid to be heated under a predetermined pressure, means for admitting said fluid to said receptacle, means for supplying a fluid heating agent to heat said receptacle, means tending to maintain a predetermined relation between the flow of the heating agent and the flow of the fluid being heated, and means constructed to control the admission of the fluid to be heated to the receptacle and to be rendered operative by variations in the temperature of the heated fluid, whereby the heated fluid may be supplied at a substantially uniform temperature.

1,008,393. Pipe-Cutting Tool. Ludolf Toegel, Buffalo, N. Y. In a pipe-cutter, a sectional clamp adapted to embrace a pipe and formed with lateral guide-sections, a sectional carrier mounted for rotation on the guide-sections of the clamp, said carrier being formed with worm-gear teeth, means carried by the clamp to engage the worm-gear teeth and rotate the carrier, a series of radial offset plates integral with the carrier and projecting outwardly thereof, each of said plates being formed with



outwardly extending terminal flanges and with lugs on their outer surfaces, a series of tool-holding heads having lateral slotted portions, screws extending through the lateral slotted portions into the offset plates to slidably hold said heads against the plates, and lugs thereof, screws threaded into the heads and swiveled to the flanges of the plates, tools adjustably secured to the inner ends of the heads and projecting inwardly thereof, star wheels mounted on the screws, and a finger fixed to the clamp to engage the star wheels.

1,008,939. Pipe-Wrench. William Louis Bessolo, Denver, Colo. A pipe-wrench comprising a handle, a jaw pivotally connected therewith to permit a limited oscillating movement of either member, the handle member having a shoulder to limit its movement in relation to the jaw in one direction, and a forward projection protruding above

the pivot of the jaw to limit its movement in the opposite direction, and a flexible member connected with the jaw member and co-operating therewith, the flexible member having pins adapted to enter recesses formed in the forward projection of the handle member, substantially as described.

1,008,432. Heat-Distributing System. William H. Pearce, Chicago, Ill. In a heat-distributing system, the combination of a supply-pipe, an insulating casing entirely surrounding the pipe and spaced therefrom, means within the casing for supporting the pipe out of contact with the casing, and means exterior of the surrounding wall of the casing for anchoring the pipe-supporting means.

1,008,416. Valve. Joseph P. Lavigne, Detroit, Mich. A valve comprising a casing having a cylindrical bore provided with inlet and outlet openings communicating therewith, a bonnet on the casing in axial alignment with said bore, an inner annular rib in the bonnet, a cylindrical closure fitted for rotation in said bore and having a conduit adapted to connect and disconnect said inlet and outlet openings, a shouldered stem on the closure and projecting beyond said rib and terminating within said bonnet, a gasket between said rib and the stem-shoulder, a collar on the stem, a spring between the bonnet-rib and collar, a cap on the bonnet and an independent stem-actuator in corotative engagement with said stem, and loosely passing through said cap and having a shoulder adjacent the underside of the cap, and a washer in engagement with said shoulder and cap for holding said actuator against pulling out of the cap.

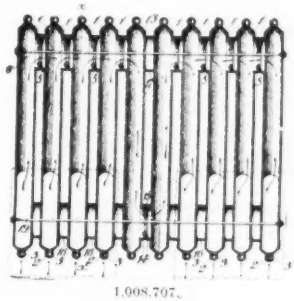
1,009,769. Damper for Heating and Ventilating Systems. Joseph E. McGinness, Pittsburgh, Pa. The combination with a flue, of a damper pivotally mounted therein and provided with an operating stem extending through the flue-wall, a handle connected to said stem for operating the damper and being detachable therefrom, a lock for securing said stem to a fixed part of the flue, to prevent movement of said stem, and a shaped key co-operating with said lock and being entirely separate therefrom and removable therefrom.

1,008,707. Radiator. Frank W. Dilks, Philadelphia, Pa., and David Reyam and Eugene E. du Pont, Wilmington, Del., assignors to The International Radiator Co., Wilmington, Del., a corporation of Delaware. In a radiator, a set of narrow and deep vertical radiator ascent-units arranged side by side and having inlet at their lower ends and connected at their upper ends to communicate with each other, a set of narrow and deep vertical radiator descent-units arranged side by side and having outlets at their lower ends and connected at their upper ends to communicate with each other, and a pair of narrow and deep intermediate reversing units each connected at its upper end to the upper end of one unit of a set and connected with each other at their lower ends.

1,008,844. Radiator. William C. McKeown, Buffalo, N. Y., assignor to Buffalo Radiator Co., Buffalo, N. Y., a corporation of New York. A radiator comprising a plurality of vertical sections arranged side by side, each section being formed with a plurality of groups of upwardly and forwardly extending ribs spaced from one another, the ribs of each group being staggered with respect to the ribs of the adjacent group, causing the circulating currents to pursue a zig-zag course upwardly and forwardly with respect to said radiator-sections.

1,009,763. Valve. William C. Marsh, Dunkirk, N. Y., assignor to Marsh Valve Co., Dunkirk, N. Y., a corporation, of New York. A valve, embodying a casing, a longitudinally movable valve-stem therein, oppositely disposed seats in said casing, a nut mounted on the lower end of said stem, an integral disc-holder in said casing carrying oppositely opposed discs for engaging said seats and embracing said nut, and an aperture nut loosely surrounding said stem and in screw-threaded engagement with said disc-holder, said aperture nut loosely engaging said first mentioned nut to retain said disc-holder on said stem, the contacting surfaces of the parts being such that said disc-holder is permitted a bodily rocking movement when moving into contact with either seat.

1,008,885. Pipe and Bolt Thread-Cutting Machine. Charles Bergren, Duluth, Minn., assignor to James Henderson, Duluth, Minn. A thread-cutter comprising a casing and having a central cylindrical wall, a horizontal gear resting upon the upper end of said cylindrical wall and having a downwardly extendng annular flange engaging the outer periphery of said cylindrical wall, means for rotating said gear, said gear having an angular recess terminating in a vertically reduced opening, a clamp member having a cylindrical portion extending into the cylindrical wall of the casing and having its inner periphery flush with the opening in the die-gear, said cylindrical



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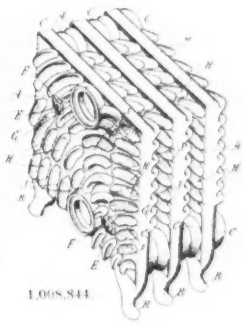

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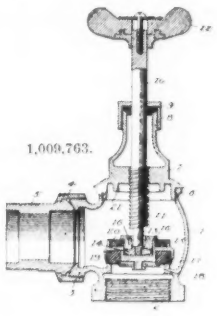
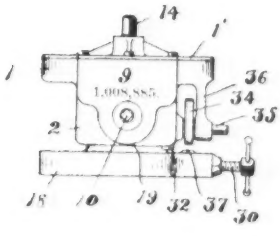


1,009,763.



walls having vertical registering semi-circular recesses, a coil-spring in said recesses and having means therein locking the same together against rotation, a pipe-clamp carried by the lower end of said cylindrical portion.

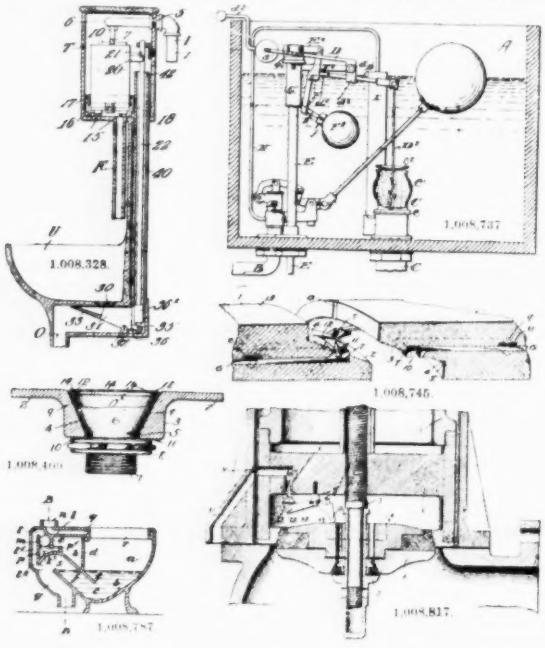
Plumbing Department.

1,008,328. Urinal. Irving L. Hammond, Lewiston, Me. In a device of the class described, a urinal comprising a bowl having an opening; a pan fulcrumed intermediate its ends upon the urinal, and located below the opening; a slidably-mounted rod acting gravitationally against one end of the pan, to lift the other end of the pan, and to maintain said end of the pan in close proximity to the bowl; a tank having an outlet discharging into the bowl; a second pan tiltably supported within the tank; a locking mechanism for holding the second pan in liquid-retaining position, the lock being operatively connected with the rod; the first-named pan being tiltable under the added increment of the material to be flushed away, to raise the rod and to release the latch, whereby the second pan will be set free to dump its contents.

1,008,737. Water-Closet. Frederick A. Schossow, Detroit, Mich. In a device of the character described, a flushing tank, a hinged seat, a valve controlling the discharge of water from the tank, a lever adapted to operate said valve, a hand-operated lever having connection with the aforesaid lever, a movable weighted rod adapted to be operated by the seat, a member rigidly secured to one end of said rod, a latch swinging connected to said rigid member and provided with a notch intermediate its ends for detachable engagement with the valve-operating lever, and means having connection with said swinging latch and movable with the latch to engage and disengage the latter from said valve-operating lever, and when in engagement with the latter to hold it in such position as to cause the valve to remain open a predetermined period after lowering the rod.

1,008,745. Pipe-Sewer and Conduit. Godfrey Lewis Smith, Newport News, Va. A concrete pipe composed of a plurality of sections having interlocking bell and

spigot portions at their ends, said sections each having a plurality of longitudinally disposed bracing members formed therein, annular bands in the pipe sections passing around the various longitudinal members for binding the same together, and interlocking male and female portions formed on opposite ends of the longitudinal members and projecting inward from the bell and outward from the spigot end for engagement with the corresponding member of the adjacent section to lock said sections together.



1,008,400. Waste-Fitting. James B. Wise, Watertown, N. Y. In combination, a one-part waste-thimble having a tubular body and a flaring top, the extreme upper end of the thimble being bent inwardly for forming an annular flange to support a strainer, and a strainer having peripheral radial lugs engaging said flange, and having a depending flange engaging the inner surface of the flaring top of the thimble for supporting and holding the strainer flush with said annular flange.

1,008,787. Siphonic Water-Closet. Arthur William Cooksey, London, England.

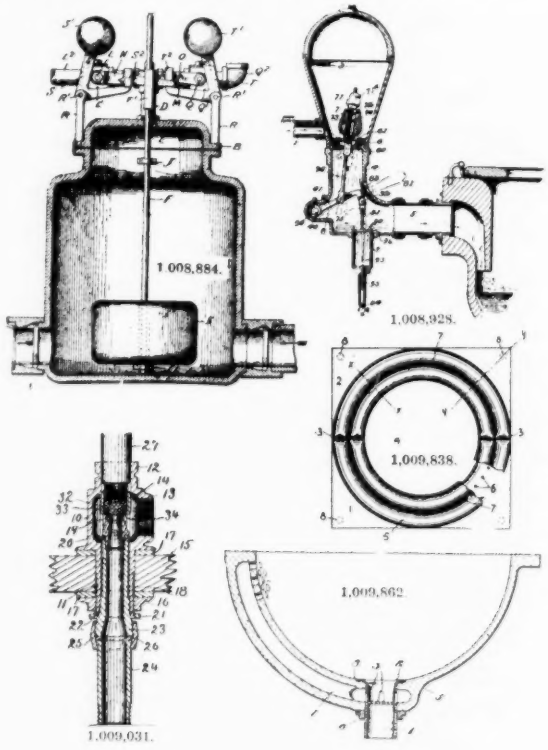
1,008,817. Drain-Valve. William Charles Hammond, Spokane, Wash., assignor to Joseph H. Boyd, Spokane, Wash. The combination of the cross-arm of a hydrant having a lever suitably supported thereby on its under face, the said cross-arm being provided with an upwardly and transversely extending outlet, together with a valve on one end of the said lever adapted to close the said outlet, the other end of the said lever being provided with a downwardly extending portion for engagement with the valve of the said hydrant.

1,008,884. Automatic Sewage-Ejector. William P. Anderson, New York, N. Y. An automatic sewage ejector apparatus comprising a tank, a top therefor, an air or steam-pressure supply pipe leading into the tank, a float rod movable through a suitably packed gland in the cover, stops upon the float rod, a float loosely mounted upon the rod intermediate said stops, a yoke forming a part of said rod and provided with slots, an inlet valve casing and valve in said pipe and valve in the casing, a lever to said valve, a vent-valve casing and valve therein, a pipe communicating between the valve casings, said vent-valve casing open to the atmosphere, a lever connected to the vent-valve, said levers extending each through a slot in the yoke, standards rising from the cover, an angle lever pivotally mounted upon each standard, a weight upon one arm of each angle lever, the other arm of each lever provided with a slot for the reception of a lever.

1,008,928. Flushing Apparatus. Leo Simmons, Washington, D. C. Flushing apparatus comprising an elbow casing, the horizontal outlet arm of which is adapted to be coupled with the article to be flushed, an enlarged vertically disposed dome having a water-supply inlet at its lower portion, said dome rising from and at its lower end fitted to said inlet end of the casing to discharge thereinto, a vertically movable main-valve normally closing the outlet from and rising in said dome and formed with a longitudinal water passage, a relief-valve normally closing said passage, a lifting rod for said main and relief-valves arranged to open the same in sequence, said rod depending therefrom into the vertical portion of said casing, a manually-operated valve actuating and controlling arm extending laterally in said casing and coupled to said rod, a cylinder depending from said casing and at its upper end opening into the lower portion of the interior thereof, and a disc loosely arranged and vertically movable in said cylinder and coupled to said arm.

1,009,031. Coupling for Float-Valves. Thomas D. Millea, Springfield, Mass., assignor to The Universal Tool Co., Springfield, Mass. As a new article of manufacture, a coupling comprising a hollow body provided with an external flange and seat externally screw-threaded both sides of said flange, and further provided with a compound-seat at the terminal between which and the first seat is located said flange, such compound-seat comprising an internal tapered seat-portion and a seat-portion at the outer end of said first-mentioned seat-portion.

1,009,938. Toilet-Seat for Children. Margaret L. Handy, Caro, Mich. In combination, an auxiliary toilet-seat formed of two hinged sections and with a central opening, the inner edges of said sections being rounded; the bodies of said sections formed with circularly arranged perforations; a circular pad removably stitched at its middle portion through said perforations, the free inner



edge of said pad projecting over the inner rounded edge of said sections.

1,009,862. Outlet and Strainer for Wash-Basins. Johannes Ruckstinat, Toronto, Ontario, Canada. A basin outlet and strainer having lateral overflow-openings through a straight-walled tubular body and a plurality of fingers partially punched from said body wall and bent downwardly to the center, thereby providing both a strainer and the lateral overflow-openings.

PACIFIC COAST LETTER

San Francisco.

The actual letting of contracts for the new work is dropping off slightly as is to be expected at this season but plumbers are still busy on old contracts, as well as on a large amount of jobbing work that comes in at this season. It is hoped that the new year will see the coming-on of a number of good jobs. January and February are usually bad months for work but they are sometimes very good ones for contracting. A good deal of attention is being given to the Panama-Pacific Exposition and to the buildings which the projectors have promised to get under way at an early date. Plumbing contractors do not expect that they will be called on to do any final figuring until we l along in the year.

G. W. Dougherty, a piumber and steamfitter of 114 Clement St., is now enlarging his shop and putting in new fixtures.

There is at present a good deal of activity in the Board of Public Works and other municipal boards, and it is anticipated that a considerable amount of work will be let between now and the first of the new year, when the present administration will go out of office. Bids have already been received for the plumbing on eight of the San Francisco hospital buildings. The John G. Sutton Co. was the lowest bidder on six of these jobs, the Turner Co. on one and J. Looney on one. The Board of Public Works has also awarded to J. P. M. Phillips the contract for the construction of a safety station at Market, Battery and Bush streets for $1,800. Contracts for work on the academic building of the Polytechnic High School are now being let.

Jeremiah Looney, a well known plumber of this city, who has been in Klamath Falls, Ore., for some time installing the plumbing work in the White Pelican Hotel building, has notified the local trade that he has secured another good contract at Klamath Falls and will take his force from the hotel building to a large three-story apartment-building without loss of time.

Los Angeles.

The Board of Education is now receiving bids for the heating and ventilating of the central building of the Manual Arts School.

The Wrought-Iron Range Co. has been awarded a contract for the kitchen and pantry fixtures in the 12-story and basement Athletic Club building for $9,500.

Blumve & Jay have been awarded a contract for the plumbing and steam-heating in an 11-story and basement building now being erected by the Van Nuys Building Co., at the corner of Seventh and Spring streets. The job will amount to $55,800.

Elsewhere on the Coast.

Santa Maria, Cal.—At a recent election it was voted to issue bonds to the amount of $75,000 for the installation of a sewer system.

Palo Alto, Cal.—Harry B. Morey has been awarded a contract for the installation of an underground boiler-room and heating plant for J. B. Coryell, of Fair Oaks. The plant will be used for heating a number of greenhouses.

Oxnard, Cal.—W. L. Dunn, known to the California trade as the inventor of a wrench for the handling of large oil-pipe, has just perfected a new chain-wrench for small pipe. This is now being tried out by a number of southern California plumbers.

Sacramento, Cal.—The contracts for the new D. O. Mills bank building are now being let, and it is expected that the plumbing and heating contracts will be let within a few days. The Lamson Consolidated Store Service Co. will install the pneumatic tubes for $1,900.

Sacramento, Cal.—The Plaza Plumbing Co. has recently been incorporated by Alfred F. Freese, Herman Ross and D. M. Lemmon. The purpose of the new corporation is to do a general plumbing and electric contracting business. The capital stock is announced as $10,000, nearly all of which is already subscribed.

Pasadena, Cal.—About the largest plumbing, heating and ventilating contracts which have been let in the smaller cities of the Coast this year are those of the Polytechnic High School building. The plumbing contract, which amounted to $27,448, went to Munger & Munger, of Pasadena, and the heating and ventilating contract to the E. O. Nay Co., of Los Angeles.

Tacoma, Wash.—Plumbers here are doing a little preliminary figuring on the plans for the remodeling of the plumbing and heating of Moose Hall. The plans call for the installation of a complete gymnasium, lockers, shower and other baths, kitchen, etc.

Seattle, Wash.—The first shipment of Alaska tin, amounting to 74 tons, has been received on the steamer Corwin. This will be converted into solder and will be largely marketed in Seattle for the salmon canning industry. Heretofore the Seattle salmon canners have imported their tin for solder-making from Singapore.

Sedro-Wolley, Ore.—The Oregon State Board of Control let contracts this week for a large amount of work to be done on the Northern Hospital for the Insane here. The plumbing and heating contract went to a Seattle firm, the Eckhart Heating & Ventilating Co., whose bid of $34,920 was the lowest of ten bids submitted.

Vancouver, B. C.—Bids are being received by the city clerk for the heating plant and for disinfecting apparatus at the new isolation hospital now under construction.

NEW BUSINESS VENTURES.

Utica, N. Y.—J. B. Witte & Sons have incorporated their plumbing business with a capital stock of $10,000. The incorporators are John B. Witte, Henry F. Witte and Frederick M. Witte, all of this city.

Basin, Wyo.—A. A. Grady, for some time connected with the Big Horn Supply Co., Big Horn, Wyo., has opened an up-to-date plumbing establishment here with a very attractive show-room.

Ada, Minn.—A. W. Perry has opened a plumbing and heating establishment in this town and has already secured several nice contracts.

Fort Smith, Ark.—The Realty Plumbing Co. has been incorporated with a capital of $5,000 to conduct a plumbing business. The new company's establishment will be located at 617 Garrison Ave., and its officers are: Burley C. Johnston, president; E. E. Edmunds, vice-president; Leigh Kelley, treasurer; Thomas Daily, secretary; M. E. Hollis, manager.

Hartford, Ind.—Fred Schwartz and David Linger have formed a partnership under the name of Schwartz & Linger and will open a plumbing and heating establishment on South High street about the middle of December.

Grand Rapids, Mich.—W. A. Reynolds, 273 Stocking St., is so busy that he hardly knows how to take care of the jobs on hand, finding it difficult to secure enough assistance of the capable kind he insists upon having. He has recently installed three toilets for the Johnson Furniture Co., the entire plumbing work in two houses on Hall street for Mr. Hillebrand, and in a two-family house on Cedar street for Mr. Wagner.

Grand Rapids, Mich.—The Pulte Plumbing and Heating Co. has its hands full of business these days. Among other contracts, it has just been awarded that for plumbing and heating the Citizens' Commercial and Savings Bank, Flint, Mich., plumbing and heating in the government building at Ionia, Mich., and the Keeler building, this city. It has recently completed installing the plumbing in the new No. 12 engine-house, and will soon begin work at the new filtration plant. Steam-heating has just been installed in the United States Rusk Co's. plant on Hamilton street and the Chas. A. Coye building on Campau street, besides many smaller jobs.

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WANTED—FURNACE AND BOILER salesmen who can produce results, for Ohio, Indiana and Michigan. Address Giblin & Co., Utica, N. Y. 12-9

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WANTED—WHOLESALE JOBBERS IN plumbing and steamfitting goods in western Canada have vacancy for 3 first-class travelers. Must be able to draw plans and take off material. Applications must contain full particulars re experience, references and salary expected. All applications treated confidentially. Address No. 737, "Domestic Engineering," 445 Plymouth Court, Chicago. 9.

MISCELLANEOUS.

PARTNER WANTED—I WANT A partner in my plumbing and heating business, or a man to buy that part of my business. C. A. Pryne, South Haven, Mich. 12-16.

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"Domestic Engineering" Patent Bureau is the result of many inquiries for reliable patenting facilities. "Domestic Engineering" has established a Patent Bureau in Chicago for the service of those whose location may not enable them to make personal investigation of the reliability of patenting offices or whose lack of acquaintance with the subject makes it desirable that efficient protection should be given them from fraud or imposition. Any of our readers desiring to patent any inventions and devices should address communications to F. Gerlach, "Domestic Engineering," Patent Department, 445 Plymouth Court, Chicago. No charge will be made for consultation.

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